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TO WHAT EXTENT ARE TEETH NECESSARY TO CIVILIZED MAN?

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This discussion as to the doubtful necessity of teeth to civilized man is not from the view point of "a bald and toothless future," nor is it to imply that I do not believe in their utility, comfort and beauty; on the contrary, I believe that the full number of perfect teeth in their normal position with healthy environment gives the best balance, the best harmony and the most satisfaction from every view point, but what civilization may evolve in the future seems so many ages ahead that it hardly need concern us at the present time. Nature is so kind, however, that she has fixed on us a wide margin of variation from our present standard of normal and still preserves to us a good state of health.

This is true both in anatomy and physiology, otherwise the callings of surgery and medicine would not exist, in fact, perfect physique with perfect function is so rare that it is hypothetical rather than real. The labors of a physician seem largely to be spent in endeavors to assist nature in restoring the patient to what is considered a normal state; and yet what we consider being well is most likely quite a distance from perfection.

In any event, many persons live with comfort a moderately long life, maimed in some way, or with known defects in some function. There may be loss of tissue in kidney, lungs, brain, teeth and many other organs without serious impairment of health; some of these defects man has learned to supply mechanically, notably artificial limbs, teeth and eyes.

There seems to be something about man, when he finds he is

able to supply these losses, which so sets him up in his own estimation that he never loses an opportunity to try his hand, and in regard to mouth and teeth, it is my opinion that many times people are worse off for the effort.

In cases where all the teeth are lost great benefit may result from substitutes, but no artificial denture is at all comparable to good natural teeth even if the work be perfect, but poor work seems to be the rule and perfect work rare.

In partial losses of teeth, a large per cent. of attempts at restoration by bridgework and plates are an injury to the mouth and remaining teeth, being of little assistance in mastication and serving only as a matter of appearance, the same as a wig or a glass eye. Appearance, of course, is not to be ignored, but the insertion of jacket crowns, bridges or plates to replace a partial loss of grinding surface is more often a detriment than a benefit. First, because their attachments injure the teeth to which they are fastened and bridgework especially becomes filthy and serves as a place of incubation for all varieties of disease germs. Second, because they are not needed, for two molars properly opposing each other do more good work than several substitutes. Third, the actual necessity for chewing the food is not so great as is usually held.

With civilized man the teeth have ceased entirely to be of use as prehensile organs, that is, for seizing or grasping, or as organs of defense, and the necessity of grinding the food can be replaced by machinery and cooking.

Let us consider then the manner in which the teeth assist in carrying out the processes of life. Toothless animals live on practically the same foods, as to the chemistry, that other animals do. Foods in order to sustain animal life must contain proteids, fats, carbohydrates, water and salts. The necessary chemicals for the digestion and assimilation of their proximate principles are supplied by the various glands and specialized cells of the organism. In the higher organisms these cells are largely located in the alimentary canal and its accessory glands. As digestive organs, the teeth are first for prehensile purposes, and second for grinding, but monkeys, apes and men neither have to seize their food, nor pick it up with their teeth because of the perfect development and adaptation of the arms and hands to prehensile uses.

The evolution of human teeth for grinding purposes has been

directed by the necessity of triturating vegetable substances in order to liberate proximate principles from their cellulose envelops (cellulose being indigestible), but since the advent of civilization this object is more effectually accomplished by milling and proper cooking, and the necessity for masticating food is almost completely done away with in man.

Carnivorous or flesh eating animals have no need for grinding because their food is all animal, and all parts of animal substances are soluble in some of the secretions of the alimentary tract. This is especially verified in the edentates whose food is exclusively animal in the form of insects.

Birds and reptiles are omnivorous, that is, they eat both animal and vegetable substances. Their food is swallowed without chewing, then soaked in their crops or first stomach and afterward ground by the gizzard, or disintegrated by long maceration in the canal, as the case may be. The alimentary tract, however, supplies all that is necessary for the digestion of all nourishing material found in either the animal or the vegetable kingdoms, dissolves bones with the same certainty as other foods and liberates starches and other carbohydrates from their cellulose surroundings.

Grass and grain-eating animals of necessity must grind the food well in order that the digestive fluids may better attack and dissolve vegetable substances, to the end that the desired proximate principles may be extracted and assimilated. The preponderance of indigestible material in vegetable matter is so great that the herbivores of necessity have larger abdomens and more ample intestines for the purpose of receiving and holding large quantities, in order that they may utilize enough food to sustain life.

All these animals have two distinct types of teeth, namely, incisors for seizing or grasping and molars for grinding. Their molars are all large and suitable for grinding their peculiar kinds of food. These animals are provided with means of defense other than the teeth, such as horns, tusks and sharp hoofs, or with unusual running powers.

Flesh-eating mammalia use their teeth for defense and prehensile purposes, but, as stated, have no need of teeth for grinding, the food being taken care of by the juices of the alimentary canal. Animal substances contain a very much larger percentage of nutritious material than vegetable, consequently there is not the necessity

for eating such great quantities; as a result, the alimentary canal is less capacious and usually the animal is smaller than with vegetable and grain eaters. The teeth are long, sharp and strong for tearing and for defense, the claws assisting in defense and in seizing food.

Man is classed with the primates, eating all varieties of food, and for this reason is called omnivorous; the hands are used for defense and for prehensile purposes, hence the lack of necessity of long, sharp front teeth for grasping, tearing or defense. Even prior to civilization the superior intelligence of primates enabled them to select their foods, which consists of flesh, fruits, nuts, succulent roots, etc., the grinding of which is neither so difficult nor so necessary as that of twigs, grasses and raw grain.

It is easy to understand how great the loss of one or more teeth would be to an animal which depends entirely on these organs for not only procuring the food, by nipping grass, twigs, etc., but for its trituration and separation; whereas the loss of one or more teeth to a flesh-eating animal would not mean so much providing enough were left for seizing and killing its prey. With the intelligence of primates such a loss can be supplied to a great measure by the selection of foods.

With the superior intelligence of civilized man, assisted as he is by milling and cooking, the actual necessity of teeth is almost *nil*. Laying aside the delights and entertainment of masticating palatable foods, as also the conventional ideas of beauty of the teeth, let us consider the part which the chewing of food plays in carrying out the process of life and health in man.

The following quotations from the last edition of Kirk's "Physiology" seem to be fair samples of the generally accepted idea of the subject:

"The act of chewing or mastication is performed by the biting and grinding movement of the lower range of teeth against the upper. The simultaneous movements of the tongue and cheeks assist partly by crushing the softer portions of the food against the hard palate and gums, and thus supplement the action of the teeth, and partly by returning the morsels of food to the action of the teeth, again and again, as they are squeezed out from between them, until they have been sufficiently chewed.

"The act of mastication is much assisted by the saliva and the

intimate incorporation of this secretion with the food is called insalivation.

"Mastication is much more thoroughly performed by some animals than by others. Thus dogs hardly chew their food at all, but the esophagus is protected from abrasion by a thick coating of very viscid saliva which lubricates the pieces of rough food.

"In vegetable feeders, on the other hand, insalivation is a much more important process. This is especially so in the ruminants; in these animals the grass, etc., taken is hurriedly swallowed and passes into the first compartment of their four-chambered stomach. Later on it is returned to the mouth in small installments for thorough mastication and insalivation; it is then once more swallowed and passes on to the digestive regions of the stomach. This is the act of rumination or 'chewing the cud.'

"In man, mastication is also an important process, and in people who have lost their teeth severe dyspepsia is often produced, which can be cured by a new set of teeth."

This "cure by a new set of teeth" I believe to be often overestimated, since many mouths are of such a shape or the tissues in such a condition that the greatest skill can hardly create an artificial denture that is usable, and if the teeth be necessary advice to have them extracted should be well considered before it is given. It is a fact that many never learn to wear artificial teeth with benefit, even though they are perfectly made, and as a result, the whole of the digestive work is done in the stomach and intestines.

As to insalivation, the saliva in reptiles is almost entirely for lubrication, it being copious and viscid. It seems to be largely so in all animals, but more especially in the carnivorous and omnivorous animals, its chemical action, according to Kirk, being small. He says:

"The action of saliva is two-fold—physical and chemical. The physical use of saliva consists in moistening the mucous membrane of the mouth, assisting the solution of soluble substances in the food, and in virtue of its mucin lubricating the bolus of food to facilitate swallowing.

"The chemical action of saliva is due to its active principle, ptyalin. This substance belongs to the class of unorganized ferments, which are called amylolytic (starch splitting), or diastasic

(resembling diastase), the similar ferment in germinating barley and other grains.

"The starch is first split into dextrin and maltose; the dextrin is subsequently converted into maltose also; this occurs more quickly with erythro-dextrin, which gives a red color with iodine, than with the other variety of dextrin called achroö-dextrin, which gives no color with iodine.

$10 (C_6H_{10}O_5)_n \text{ (starch)} + 4n H_2O = 4n C_{12}H_{22}O_{11} \text{ (maltose)} + (C_6H_{10}O_5)_n \text{ (achroö-dextrin)} + (C_6H_{10}O_5)_n \text{ (erythro-dextrin)}.$

"Ptyalin acts in a similar way, but more slowly, on glycogen. It has no action on cellulose, hence it is inoperative in uncooked starch grains for in them the cellulose layers are intact.

"Ptyalin acts best at about the temperature of the body (35-40 C.). It acts best in a neutral medium; a small amount of acid stops its activity. The conversion of starch into sugar by saliva in the stomach continues for a short time, from fifteen to thirty minutes. It then ceases, owing to the action of the hydrochloric acid secreted by the glands of the stomach. The acid which is first poured out neutralizes the saliva and combines with the proteids of the food, but when the free acid appears ptyalin is destroyed and so it cannot resume work when the acid is neutralized in the duodenum. Another amylolytic ferment contained in pancreatic juice (to be considered later), however, digests starch in the intestine."

It would seem, then, that the chemical action of saliva is so soon cut off by the effect of the hydrochloric acid in the stomach that this action might be dispensed with, and also that moistening and lubrication can be replaced by the various beverages. Kirk further says:

"The conversion of starch into maltose is the most powerful and rapid of all the actions of the pancreatic juice. It is much more powerful than saliva and will act even on unboiled starch. The absence of this ferment in the pancreatic juice of infants is an indication that milk, and not starch, is their natural diet."

Now, assuming this to be the best we know of this feature of physiology, let us add further evidence to the point in question by asking each one how many teeth he has lost and to what extent this loss actually cuts any figure in regard to his health? If you are a physician, what actual knowledge have you that the loss of

even eight or ten grinding teeth really makes any difference in the health of the individual? In other words, how necessary are teeth to civilized man?

This feature is well summed up in "Tripler's Manual on the Examination of Recruits," by Chas. R. Greenleaf, Col. Asst. Surgeon General U. S. Army, April 10, 1890.

Under the heading "Loss of Teeth," he says:

"The condition of the teeth is to be considered solely with reference to the proper mastication of food. If there are not enough in the mouth for this purpose food is swallowed without the necessary preparation, and indigestion with imperfect nutrition and its consequent evils are the result. If several of the teeth are decayed, especially about the crown, it is probable that before the expiration of an enlistment they will be so far destroyed as to render mastication imperfect; hence, men who have lost the front teeth from decay and have many unsound back teeth should be rejected. The loss of front teeth through accident is not cause for rejection, provided a sufficient number of back teeth are sound.

Unless an applicant has at least four sound double teeth, one above and one below each side of the mouth, and so opposed as to serve the purpose of mastication, he should be rejected. Exception may be made by the Adjutant General in the case of a soldier who desires to re-enlist, if a report is made showing his age, physical condition as to nutrition, and the number and location of the sound teeth.

If the front teeth remain and the double teeth are gone, rejection is demanded.

If the loss of natural teeth is supplied by artificial ones, the fact should be noted on the enlistment papers; but the artificial substitutes can not be considered as equivalent in value to the natural teeth or as removing the disability on this account for military service."

The foregoing seems a practical summary of the situation; that is, that the loss of two-thirds or eight of the "back teeth" does not debar entrance, and if "back teeth," in this case, includes the bicuspids, fourteen grinding teeth could be missing and still the applicant be accepted.

These instructions also indicate that artificial teeth are not at all considered as substitutes for natural ones. It must be remembered

in this connection that there is not much choice in army rations, a point which no doubt is taken into consideration by the examiner.

I believe, however, that there is no question but that in any modern civilized community the demands of health can better be met by the proper selection of foods and their proper preparation, where the molars may all have been lost, than by the use of artificial substitutes without such care.

The mutilation of one or more good teeth for the purpose of supplying one or two back teeth in the form of a bridge, seems to be a wholly unjustifiable procedure, even if the work always remained good. In a large percentage of cases, however, either the material or the mechanical work goes to pieces in a comparatively short time, or the anchorage teeth are loosened and lost from the excessive strain put on them.

The present status of civilized justice, and the general acceptance of the golden rule by high-minded people in all walks of life, demands of our specialty that we have the knowledge, first, to advise against the loss of teeth; second, when losses must be or have been made, to be sure that substitutes will be of more use than proper instruction as to suitable diets to meet the case. Advice as to diet seems quite necessary, since the average layman's idea of physiology seems to be based on taste or opinion instead of on facts; as to this point, I am afraid some of our physicians and dentists come in for the same criticism. Justice also demands that we be above advising work of any kind for the sake of the paltry dollar.

The dollar, however, is acceptable to us as to others. From this view point, the teaching of the desirability of perfect natural teeth with absolute cleanliness and how to keep them so, accompanied by the necessary treatment to produce healthy, aseptic conditions, is much more remunerative; also of much more benefit and giving more satisfaction to the patient than the other plan.

Now, while clinical and scientific facts seem to show that man can live without teeth, or with a greatly reduced number, it certainly is most becoming in us to advise strongly against the popular idea of the slight importance of the teeth, and to renew our vigor in efforts to preserve them by preventing decay and disease of the surrounding tissues, thus escaping the trouble of premasticating foods and avoiding the undesirableness of substitutes for teeth, also being spared the chagrin and comical pathos of a toothless smile.

DISCUSSION.—*Dr. Eugene S. Talbot*, Chicago, said that the dentist believes that it is impossible for a man to live without teeth. Dentistry due to uncleanliness in the insertion of bridges, etc., has as much to do with disease as any other one thing. The collection of germs about an ill-fitting crown is more detrimental to man than no teeth. In the lower vertebrates teeth are necessary not only for masticating, but for prehensile purposes. As man rises in evolution the jaws and teeth are of less importance, until at the present time it is questionable whether teeth are necessary. For years Dr. Talbot has believed that men can get along without teeth. Men have lived to be 90 or 100 years of age and have been without teeth for fifty or sixty years. Owing to methods of preparing food to-day, it does not require mastication, and the jaws show in the evolution of man a shortening up, decay and loss of the teeth due to disuse, and as evolution advances it will be seen that man can get along without teeth. Loss of the teeth due to interstitial gingivitis is a marked illustration of the fact that the teeth are passing. If man lives long enough he will lose his second teeth. In the snake, elephant, etc., teeth are continuous; they come into the mouth, are used a short time, and then pass and a new set comes in. This condition is illustrated in man by the fact that he has two sets of teeth. The first set is lost and a new one takes its place. Interstitial gingivitis is set up and the alveolar processes are absorbed. In regard to bacteria in the mouth, there is no question that modern dentistry is doing more to injure the teeth and the alimentary canal than any one thing. The filthy condition of the mouth under bridges and crowns is certainly not conducive to health. Crowns should never be placed under the gums, but should only extend to the line of the gum margin. Immediately the gold margin passes under the margin of the gum interstitial gingivitis is set up and nature produces absorption, and in a short time the gum margin will recede.

Dr. Frank L. Platt, San Francisco, said that although it is possible for man to live without teeth, he did not think it a good plan for him to do so. He is heartily opposed to eating prepared food that is easily digested; he is opposed to vegetable food and health food. Patients who have taken up this mode of living are all losing their teeth, show evidence of malnutrition, are anemic and miserable specimens of humanity. Bridgework and crown work properly prepared is unquestionably beneficial. Dr. Platt said that he had

lost a bicuspid and molar on each side; about ten or twelve years ago he commenced to suffer from indigestion; he consulted physicians and was placed on different kinds of foods; he had a test meal and the contents of the stomach were examined an hour after. That settled it. He took no more prepared foods. He had some bridgework put in one side, which served all purposes so well that he has never taken time to put one in on the other side. He was cured of his indigestion in a few weeks, having learned to grind his food. He believes that if work is well performed it is beneficial. He does not believe teeth should be left standing alone. A single tooth is better braced by a properly made and fitted bridge; it retains it in position. Teeth were given for a definite purpose; they should be maintained as long as possible, and if any are lost they should be replaced.

Dr. G. V. I. Brown, Milwaukee, said that the question is not, "Can we live without teeth?" but "Can we live as well without teeth?" The assumption is that because there are bridges and crowns they must necessarily be uncleanly. They often are. These people without teeth have just as many bacteria as those with teeth. A man can get along without legs or arms, but nobody is going to advise him to do so. The surgeons can now remove almost any organ and yet the patient will live; yet who wants to give up any of his organs? There is a good deal more in this subject than the subject of bacteria. Gingivitis is a natural process taking place in an unnatural way. The animal economy gets along better with a good full complement of teeth than it does without them. The mere fact that the chemist has prepared artificial food that can be digested without mastication is no argument against the use of teeth for masticating purposes. They have been obliged to do this to help out the people without teeth or the people who are too lazy to use their teeth. In a certain sense nature after a time gets rid of the teeth, but why? Not from a physiologic standpoint at all; it is senile decay. With proper care of our teeth, of the general health, and by eating proper foods, senile decay can be put off. The natural life of man used to be called sixty years. It is not so now. It is getting to be ninety, because we have learned to take better care of our bodies. Mr. Gladstone, premier of England, was once asked, "To what do you attribute your good health and long life?" He replied, "To proper mastication of my food." On being asked what

he meant, he said, "I have thirty-two good teeth, and, consequently, when I masticate my food I give every morsel of food that goes into my mouth thirty-two bites." Dr. Brown expressed his opposition to the idea that we can get along without teeth. We can do it, but with the greatest of care in the preparation of food. As to the examination of soldiers' teeth at the Presidio in San Francisco there was a large recruiting camp, and for a time nearly all of the operations performed were on recruits. The regulation required as a minimum four teeth that would oppose. Many times examinations were made by a physician, and all he did was to look in and see if there were four teeth opposing each other. No examination was made as to whether decay was present. These teeth would soon decay after the men went on duty and indigestion follow; probably the men would be sent home without having done a day's work. Dr. Brown wrote an official letter suggesting that the minimum number of teeth should be increased, that each man should have four opposing molars on either side of his mouth, and greater care exercised in examination of these teeth. This was done, and Dr. Brown thinks that the dental corps did one good thing in raising the standard of the teeth required. Many men invalided home are men with very poor teeth, and they have dyspepsia, acute gastritis, acute enteritis, colitis, etc., rendering them useless for service.

Dr. M. I. Schamberg, Philadelphia, said that the time may come when people will be able to get along just as well without teeth. Undoubtedly teeth are deteriorating because of lack of proper mastication. It is also true that the use of the third molar tooth is being gradually lost. The jaws are no longer able to accommodate the teeth, and it is possible that in time to come there will be a peculiar formation of head, in which the upper portion will be very broad to accommodate the immense brain, and tapering to a point at the chin, with an aperture sufficiently large to breathe and to take food without mastication. It should not be allowed to go out that dentists believe teeth are useless organs and can be dispensed with.

Dr. A. E. Baldwin, Chicago, considered that there is nothing more productive of a healthy mouth than the use of the teeth. If a man or woman has been so unfortunate as to lose a portion of these organs which nature supplied for masticating food, bridges and plates—although but substitutes—are good substitutes and to be commended. Some work is detrimental, not only to the conditions

in the mouth, but to the durability and efficiency of the natural teeth that remain. Dr. Baldwin considered it possible that a tooth with a crown extending below the margin of the gum might, with certain possible exceptions, produce interstitial gingivitis, but from over twenty years' experience, having seen a great many teeth that had been crowned, he would hardly think Dr. Talbot's position tenable. In some cases it is absolutely necessary to place the crown below the margin of the gum to cover the destroyed portion of the tooth. Crowns are still doing good service after twenty years. Teeth, health, and all vital principles will be better sustained by using foods which demand mastication.

Dr. M. L. Rhein, New York City, agreed with Dr. Baldwin in regard to a crown that necessarily goes below the gum line. It is all a question of the technic. Dr. Rhein differed decidedly with Dr. Fletcher's contention against the practicability of artificial substitutes. He also opposed the views presented about the future outcome of the race, saying that he could see nothing in the statistical history of the human form that will agree with that view. There is always a diverging point where nature steps in and saves the day, generally by cross-breeding of the races.

Dr. V. A. Latham, Chicago, said that teeth are not the only things to be considered. Man demands a number of things by which his existence must be carried on. Teeth are only one adjunct of the whole. So soon as teeth are extracted jaws are changed. There is a change in the cusp, and degeneration, and a change in the nervous mechanism. Without natural articulation there is an atrophied condition. Recession of the gum follows atrophy. If the tooth is crowned the mouth should be able to take care of that tooth; foreign bodies are encysted in the heart, then why should not the gum encyst and take care of that foreign body without irritation?

SELECTION AND ASSEMBLING OF TEETH FOR ARTIFICIAL DENTURES.

BY C. O. METZLER, OMAHA, NEB. READ BEFORE THE NEBRASKA STATE
DENTAL SOCIETY AT LINCOLN, MAY 16-18, 1905.

The selection and assembling of teeth for an artificial denture may not be thought of as a very important consideration, but in the mind of your essayist is the most important when we undertake to make an artistic case.

There is more to be considered than merely making a denture fit so the patient can masticate the food. When a patient comes to the dentist to have the lost teeth replaced, this should not be all the dentist cares to do. The patient has the right to expect that not only will the functions of mastication be restored, but also, as nearly as possible, that the natural expression of the face will be maintained.

The mouth, including the teeth, and the eyes with their surrounding parts, are the most important factors of expression to the face. We should readily see that if we have selected teeth not in accordance with the natural characteristics of the patient, we will surely fail to give a pleasing expression to the mouth and surrounding parts.

How many times we see artificial dentures in the mouth that are so far from being in harmony with the characteristics of the person wearing them that they impress one with the idea that they have been procured at the bargain counter and never intended for any one particular person.

A few of the more common errors we will find are that the teeth selected are of an entirely too light a shade and nearly always too small a mould and their arrangement too regular. With this we have a denture that will always show that it is not natural, but artificial and out of place. If we examine a number of mouths we will find but a small percentage of the natural teeth that would be considered regular in alignment, and when we see a person with a perfect set of natural teeth the suspicion at once arises as to whether or not they are artificial.

The dentist may be an expert mechanic and make a well-fitting denture, but unless the teeth have been properly selected and arranged the case is a failure, and may be called simply "making a plate" instead of what the patient should expect and the dentist should be prepared to make, viz., an artistic denture. We might say that an artistic artificial denture is one where the laws of nature have been complied with in the way of the harmonizing in size, in form, in shape and in alignment with the physical characteristics of the patient, so that the opening or closing of the mouth will show no suspicion nor lack of harmony.

In the selection of teeth for an artificial denture we should study the temperament of the patient and the temperamental characteris-

tics of the teeth to be used. Your essayist will give here a system by which this may be used to a great advantage. First, copy the table of indications for diagnosis of the temperamental characteristics of the teeth from the American System of Dentistry or American Text Book, and study it until it becomes familiar, and then place where it may be convenient for reference. Get as many impressions of patients having natural teeth as you can, the greater the variety the better. After you have taken the impression, make notes of the patient according to the characteristics of temperament, viz., basis, stature, osseous development, muscular development, contour, circulation, face and features, skin and complexion, hair and eyes.

We should also take into consideration the temperamental characteristics of the teeth and make notes accordingly—size, shape, color, texture, enamel, surface, edges, arrangement, articulation and arch. The faulty gums and rugæ may be considered.

The notes may be attached to the models after they are completed and comparisons made at different times when patients come to have artificial dentures made.

We now have a good foundation to work upon, providing we have a good variety of these models articulated and the tables familiarized. This will give some idea of the size form, shade and arrangement of teeth that may be placed in the mouths of patients. When the patient comes you may proceed to make notes just as has been mentioned before, according to the temperament, and then take the impression and bite. The patient that insists upon having pearly white teeth may be convinced that they are not proper for her to wear, and when she learns that the selection of teeth is not merely guesswork, in the matter of which she considers herself a good guesser, you have gained the confidence of your patient, and the next necessary proceeding is to get a good deposit fee, just to make them fit well. The patient may then be dismissed and the models made. You then make up a table of the diagnosis of the temperament from your notes, which should compare favorably with the characteristics of the patient.

We find that there are four temperaments, viz., the lymphatic, the sanguine, the bilious and the nervous. With these four we have their combinations, making twelve more. The temperament of a patient will generally be found to be one of the compound temperaments, and this, of course, will be more complicated and make the

selection of the teeth more difficult, but from comparing the temperament with notes made and attached to the selection of models and comparison of the tables we have, the selection of the teeth may be made.

There are other points now to consider which are of vital importance; the selection of gum section or plain teeth, long or short bite and ridge lap, should the arrangement of the teeth permit, and if there is a great amount of absorption the gum section may be used, for as the artificial teeth are to replace the natural, so are the deficiencies of the gum caused by resorption to be replaced artificially. There are unsatisfactory limitations as to the arrangement possible with teeth having porcelain gum, so that cases which require irregular arrangement of the teeth are usually supplied with plain teeth to which the gum portion is supplied of vulcanite rubber. At the time the bite was taken the median line, occluding line, lip line and lines for guidance in the setting and arrangement of the teeth should have been made in the wax.

From the examination of the models articulated with bite plates we may determine the shut of the jaws and the bite will be selected accordingly—long, medium or short. On examining the models, which will show the amount of resorption that has taken place, the ridge lap may be decided upon. We now have the main points to govern us in the selection of the teeth, and should be able to do this with ease and accuracy.

A few words may be said relative to the assembling of teeth made by the dentist and also the manufacturer.

History mentions that about the year 1830 Samuel W. Stockton began the manufacture of porcelain teeth for commercial use, and his stock was kept in bulk in bottles, thus necessitating the assembling of the entire set by the dentist. This continued for a number of years, and, in fact, to-day some English dentists prefer to assemble their sets of teeth, and a great many times from the complaints of American dentists one would think they, also, should assemble the sets they use. Some complaints from the dentists are absurd and show very little knowledge as to the manufacture and supply of teeth.

Your essayist has given this some study and has come to the conclusion that the manufacturers of teeth are far in advance of the majority of dentists, and if we could learn to place the teeth where

they are intended we would give our patients better service and not have so many suggestions to make as why the teeth are not made this way and that way.

A few lines from the manager of one of the largest dental supply houses will give some idea of the supply of teeth that are kept for the dentist to draw from. He says: "In this house alone, one of seventeen branch houses of this same company, we have capacity in the teeth department for carrying over two millions of teeth, and the teeth trays in use here if spread out on the floor would cover 3,500 square feet, while we have room for 40 per cent. more trays than are included in this statement.

"We could not tell, nor even attempt to guess, how many artificial teeth are used per annum, and figures as to our annual output are of course not given to anyone.

"We had in stock in all houses over seventeen million teeth Jan. 1st, 1905. The pupicates or working moulds from our master moulds in actual use now will run about five thousand."

Selling teeth from trunks or salesroom will show that one side of the mouth requires more teeth than the other, and the question was asked, "Do you sell more teeth for one side of the mouth than the other?" The reply was: "According to the data of this house about 20 per cent. more teeth are sold for the left side of the mouth than the right side." Another question asked was, "Is the tooth trade decreasing or increasing?" The reply, "Our tooth trade is constantly increasing, despite the large number of cheap teeth vended and used; and while many thousands of people who formerly allowed their teeth to go until too late now have them properly cared for and preserved, the use of artificial teeth still increases as stated.

"This is partly accountable because of the advances of dental education the world around."

Your essayist will now return to the assembling of teeth, which is done almost entirely by the manufacturer, but may be done to a certain extent by the dentist to advantage. The main factories of to-day have assembled their teeth, taking anteriors or incisors and cuspids, and posteriors or bicuspid and molars. In plain teeth there are many more moulds for the anteriors than the posteriors, and in this way should a dentist wish a good selection of teeth for a small amount of money he may buy a large assortment of the anterior

teeth and a fewer number of the posterior and assemble them as he wishes. Thus, when we order a set of upper and lower, plain vulcanite teeth from our dealer by a certain mould we may find only the front six of this mould, and four different moulds may have been used in assembling the sets. In most cases the assembling made by the manufacturers will be found correct, but should you find a case where the fronts are just as desired and the backs too short, or vice versa, it is very easy to make the change, or should you order from the catalogue you may order fronts of one mould and backs of another, designating your exact requirements.

Another point might be well made in assembling the teeth. The manufacturers place all the teeth in the set of the same shade, which is not according to nature. If the natural teeth are closely examined it will be found that proceeding from the centrals backward in the mouth each tooth is of a different shade, and to follow this the teeth should be assembled according to shade, or what is termed shading.

Not a few dentists complain that the teeth on the market have cusps and cutting edges round and prominent. This is where the manufacturer leaves the work for the dentist. All teeth, unless "special," come to the dentist with sharp cusps and rounding curves that should designate them for a young person; but the dentist may grind the teeth and prepare them for the age of the person even to the imitation of decayed, abraded or even broken teeth. The decayed spots may be made by grinding out fissures or cavities and placing therein brown porcelain, which, when baked, insures a stain even if the teeth must be ground.

Your essayist has a few specimens that illustrate the extent to which nature may be imitated, and will briefly describe the person who should wear each plate.

Case 1. It can be seen that the teeth are of the pearl blue variety, and from other characteristics we would expect this person to be of the nervous temperament, with excessive development of the brain and nervous system. Small and wiry stature. The bones light and the skull full over the large brain. The muscles small, thin and strong, activity quick and given to spasmodic efforts. Contour thin, circulation active. Face thin and expression nervously animated. Skin and complexion full and pale. Hair fine, light and soft. Eyes would be of gray or blue. You will see the

teeth are very much worn or abraded and would represent the wear at the age of forty to fifty years.

Case 2. The color being of the opaque or muddy shade the cavities, broken teeth and root remaining would show that the texture was brittle and chalky. The arrangement is not close, even to the extent of having badly formed laterals. The arch large and round. The characteristics with others indicate such a plate for a person of the lymphatic temperament and would expect to see one rather above the medium. The bones large and loosely articulated. The muscles large and flabby. The contour of the body full, and without grace or beauty. The face full and expressionless. Skin leaden white or yellowish and generally cold and moist. Hair fine and of a pale blonde, and eyes pale blue or gray.

Case 3. The teeth are gray in color, the cutting edges and cusps long and the size rather small; not a cavity or broken tooth, from which we would consider the texture good. From the characteristics of this set would judge the patient to be of a nervous temperament. You will see that the teeth are worn or abraded and show stains in the fissures and sulcus, which would indicate that the case was intended for one who uses tobacco in some form.

Case 4. We see the teeth are of medium size, well proportioned and of a cream yellow. Although they have a number of fillings placed in them the appearance indicates a texture rather dense and the enamel smooth. The arrangement close and regular with a firm articulation. The arch is round and finely shaped. The vault round and arched. The rugæ are numerous and well rounded. A patient to correspond with the temperamental characteristics of the teeth here represented would be of a sanguine temperament. The arterial circulatory system large, a person rather above the medium in stature. The bones and muscles well proportioned. The contour slight and graceful. The circulation very strong and with blood red and rich. The face inclined to roundness and full of expression. The skin firm and soft and the complexion fresh and ruddy. The hair blonde, red or chestnut in color and eyes blue. From the appearance of the teeth and the fillings we would consider the patient one who would take good care of the teeth.

DISCUSSION.—*Dr. F. B. Dameron, Lincoln, Neb.:* I am very much interested in the mechanical side of this paper. I cannot, however, agree with the essayist that the manufacturers are putting

before us the right kind of teeth. They are not doing it, in my judgment.

Dr. W. H. Sherraden, Omaha, Neb.: How many dentists are there who like to take a patient and, getting the impression, select the teeth in harmony with the characteristics of the patient as regards size, shape and temperament? I don't think the dentists at large take the pains they should in making a selection of teeth. We ought all to support this point as an aid to beauty and a great thing for the advancement of the mechanical side of dentistry.

Dr. Wait, Superior, Neb.: There are several things in the paper that are quite instructive, and there are many other parts which would give better results if heeded, and one is the making of artificial dentures more natural in appearance. This is hard to do, considering our patients' whims and fancies. I don't quite agree with Dr. Dameron in regard to the manufacturing of artificial teeth. We have no way at the present time of getting at the exact kind of teeth the dentists want, but the manufacturers are undoubtedly doing the best they can. We have a great variety of moulds. The statistics quoted surprised me. I had supposed the number of artificial teeth used was gradually decreasing instead of increasing.

NON-COHESIVE GOLD AND SOME OF ITS USES.

BY H. A. SHANNON, D. D. S., LINCOLN, NEB. READ BEFORE THE

NEBRASKA STATE DENTAL SOCIETY, AT LINCOLN,

MAY 16-18, 1905.

The subject which I desire to present to you to-day is not of recent origin, nor one of the idle fancies of a day dreamer which will require time to prove the statements made in its behalf, but one which has been tried and proven to be all that is claimed for it. If the dental profession generally more fully understood the advantages which non-cohesive gold possesses over cohesive, where it is indicated, there would be a great deal more of it used.

The fact is fully appreciated that there are those who will say that the claims I make sound all very well and good, but can it be done, is it practical, and will it give service? In reply to these queries I will say that it is used very extensively by some and has proved to possess merits that cohesive gold does not. It can be done as I will demonstrate in the clinic. There are some who

will say it can only be used in certain places and for that reason object to its use. These same people forget that cavities form in places that are next to impossible to fill, and others that are out of the question to fill at all, with cohesive gold. Then why cannot this same argument be applied to the use of cohesive gold as is applied to non-cohesive gold? In fact, this same argument can be applied to any filling material we have.

In order to properly fill a cavity with any filling material, it is necessary that care be exercised in the preparation and that certain definite principles be followed in order that the operation may be a success. One of the principal reasons why many have had trouble, and failures have accompanied their operations is that they have lost sight of the fact that the preparation of a cavity for this kind of gold differs entirely from that for any other kind of filling. The cavity must be so shaped that it will retain the filling after it has been put in place. The cavity walls must bear such a relation to each other that they will hold the particles of the filling material in apposition.

Cavities may be divided into the following classes:

1. Those on the occlusal surfaces of molars and bicuspid.
2. Fissure cavities on the buccal and lingual surfaces of molars.
3. Gingival cavities on the buccal and lingual surfaces of bicuspid and molars, and the labial surfaces of the six anterior teeth.

The points a cavity must possess in order to be properly filled are as follows:

1. Four good strong walls sufficient to resist the pressure required to condense the gold.
2. Parallel walls.
3. A flat base.
4. Deep undercuts at base.
5. Undercuts must be in the dentin.
6. Margins must not be beveled.

Parallel walls can best be secured by the use of a fissure bur. In case the cavity can be reached with the straight handpiece so as to retain the parallel condition that instrument may be used, but if the cavity is located where it is uncertain it will be best to employ the right-angle handpiece. When a cross-cut bur has been used the final finishing of the margins should be done with a smooth-bladed fissure bur so that the small broken particles of enamel about the

margins will be removed. In case the floor or base is rough and the cavity is so deep that there is a liability of exposing the pulp if sufficient dentin is cut away to secure a smooth flat surface, fill in with cement and then smooth.

The undercuts should be deeper than can be obtained with an inverted-cone bur and should be made in the dentin. The amount of undercut required of course depends upon the size of the cavity, that is, the larger the cavity the deeper the undercut should be.

The margins should not be beveled for the following reason: The filling is made up of a number of layers of gold standing side by side, and in order to make these particles stand up there must be something to hold them in apposition. If this one point is overlooked there will be a breaking off of the particles of gold about the margin, and sooner or later a failing of the filling at that point. It is true that the advocates of cohesive gold will object to this finishing of the margins, for we are taught that we should in all cases establish the line of cleavage.

Of the three classes of cavities enumerated the third will be the most difficult on account of the oval contour of those surfaces of the teeth. Those cavities on the buccal surface of bicuspid are more difficult to fill than those on the surface of molars on account of the greater convexity of such surface.

Non-cohesive gold is not restricted to the use which I have given for it, but is used in conjunction with cohesive foil to good advantage to fill the cervical one-half or two-thirds of an approximal cavity. This use of the gold I will not discuss.

The instruments used for this kind of work differ from those used for cohesive gold in that they should not contain serrations as the filling is inserted by wedge pressure and then condensed by malleting. The instruments necessary for the manipulation of this kind of gold are not numerous. Nearly all fillings may be inserted with six or eight, the full set being twelve.

The gold is prepared in the following manner: There need be no hesitancy in touching the gold, as no injury will result therefrom. As an assistant in folding the gold into a ribbon I use an ordinary case knife. Place a sheet of gold in the palm of your hand and continue to fold by creasing until you have secured the proper width for the length of the cylinders, which should be one-fifth longer than the cavity is deep. Take what is known as the gold roller and

beginning at the end of the ribbon roll into the proper sized cylinders for the cavity. Make some large, some small and some medium in size for the various parts of the filling. Suppose we are to fill a fissure cavity in a molar where the cavity is already prepared. Begin with the largest cylinders standing one on end so that it rests firmly against the floor; then with a foot instrument press the cylinder to one end of one of the fissures, exerting considerable force to partially condense. That portion of the cylinder against the floor should be forced into the undercut. This process should be continued until the fissures are filled, leaving the central or main portion for the final wedging. This wedging should always take place from the center outwards and never next the margin. Each cylinder that is inserted must go to the bottom of the cavity; hence the importance of a thorough condensing at the floor each time a cylinder is inserted. As the finishing stage of the filling is reached the cylinders must be diminished in size until the final wedge is used. Further condensing of the gold is accomplished first by hand pressure and then followed by the hand mallet. The condensing with hand mallet should be more violent than would be required for cohesive gold. The finishing of the filling can be accomplished by means of stones and burs. After the filling has been partly dressed down the malleting should be repeated.

Some of the reasons why I use this kind of gold are:

First. Because it is a tooth preserver.

Second. Because I can save both time and worry for the patient and myself.

Third. Because it can be put in without the use of rubber dam, if need be.

TREATMENT OF TEETH.

BY D. MCFERRAN CROW, D. D. S., VERSAILLES, KY. READ BEFORE THE
KENTUCKY STATE DENTAL ASSOCIATION, AT LOUIS-
VILLE, MAY 15-16, 1905.

Although the subject assigned to me is an old and familiar one, still there are some new features which promise to prove interesting. This paper will be confined to a consideration of the tendency of the present time in regard to the treatment and filling of dead teeth. The term "dead teeth" is used advisedly, for "pulpless teeth" has

been the correct expression until recently. Teeth are being treated now, however, so that although dead they are not pulpless, and thereby hangs the tale. The adage "there is nothing changeless but change" fits this case nicely. We are witnessing a change in the treatment of teeth, and whether it will be for the good of mankind or the everlasting shame of the dental profession time alone will tell. It is our duty to take notice of these changes in our annual meetings and condemn or defend them as we individually see fit.

In the early days of modern dentistry the best practice in the case of dead teeth demanded that the nerve pulp be extracted, the root canals thoroughly drilled out and rendered aseptic, the apex sealed and the canals filled with gold foil. As late as a dozen years ago it was thought almost criminal to leave a fragment of the pulp in a tooth root, even in inaccessible canals. To-day there are those who advocate the practice of leaving not only portions of the pulp but who go to the extreme of leaving the whole, relying on a mummifier, so-called, to render the pulp itself a suitable filling. The practice had its beginning in cases of remote and inaccessible third molars, and was probably justified by the fact that they are generally considered of little benefit in any case and could be extracted should the procedure prove a failure.

The ease with which the operation is performed, made still easier by the advent of pressure anesthesia, is so alluring to the average busy man that it has led to the next and last step of treating all molars in this manner. It is, to say the least, a slipshod and lazy man's way and the danger lies not only in the probable effect on the individual but also in the effect finally produced on the profession.

Such revolutionary methods gain their foothold from the fact that they supersede more difficult ones, and in that very fact lies their greatest danger, for their baneful influence will permeate and affect the purpose that every true professional man has, which is to render the highest good of which he is capable.

Now, it is not good reasoning to say or to believe that a piece of anything—no matter what—the size of a pinhead placed on an exposed pulp of a molar tooth with a permanent filling crowded over it will cause the pulp of that tooth in a specified time to assume the form of dried glue or any other specified form making an ideal root filling. It is impossible to foretell what the exact condition of that tooth is in the first place without investigation or in what condition it

will be in four months' time. That, however, is the claim put forth by the manufacturers of one of the preparations for the purpose, and, very strange to say, it is endorsed by hundreds of dentists in numerous states and countries. Sometimes pulps die in teeth and they remain quiet and comfortable for years without treatment, their owners never knowing their actual condition. We often find that dead teeth remain in the mouth without the proper treatment and give no trouble. On removing the crown of a lateral incisor I once found part of a Gates drill, three-eighths of an inch in length, which had been left there twelve years before and had never given any trouble, although the root was black. Who can deny that such cases are a menace to the health of the owners? So with teeth treated in this labor-saving manner. They are a menace to the comfort and health of the patient. Thoroughness in all things should be the watchword, for verily "there is no excellence without great labor." The idea of leaving a whole pulp in a tooth in any state whatever is an unscientific and incomplete operation. It is bound to shrink after devitalization and leave a vacuum which becomes a catchall for foreign matter, decaying tooth substance, etc.

No treatment of a devitalized tooth can compare with the established method of removing every particle of nerve substance as nearly as possible, sealing the apex and making the interior aseptic and filling canals solidly. One redeeming feature in the tendency of the time is the abandonment of arsenious acid as a devitalizer. It should never be used in a tooth under any circumstances. Cocain anesthesia by pressure combined with adrenalin to prevent hemorrhage is a very simple but admirable method. When this cannot be used for lack of time or inaccessibility a small particle of paste made of cobalt morphin and creosote may be left in a tooth for days without the bad results often accompanying the use of arsenic. After a pulp has been removed the canals should be flooded with an agent which will penetrate the tubuli and then packed with cotton and left for several days before final filling. Oil of cloves and oil of cassia are splendid for this purpose. If immediate filling is necessary, make a paste of cement powder and oil of cloves and pump into canals and force guttapercha points into this.

There are times, however, when one is justified in departing from the established rule and making operations that are apparently revolutionary. The very nature of our calling demands that its fol-

lowers cultivate a broad-minded attitude toward any procedure or remedy that will alleviate human suffering and disease; but at the same time it is our duty to resist the tendency toward anything that will ultimately lower the standard of professional service and which is inclined to supersede a more difficult but more thorough operation when such is indicated.

FRACTURED MAXILLARIES AND MANNER OF TREATMENT.

BY J. W. THOMAS, HODGENVILLE, KY. READ BEFORE THE KENTUCKY STATE DENTAL ASSOCIATION, AT LOUISVILLE,
MAY 15-16, 1905.

This paper is practically an account of my professional experiences with broken maxillaries and their treatment, and while it may only prove of interest to a few, I wish to say that I have seen the time when it would have been interesting to me, for advice at such times and from anyone would have been most acceptable and gladly received.

This line of work is one of dentistry's most difficult branches and I will endeavor to explain some of the cases in which I have served professionally.

One was a young man 21 years of age. While out hunting he set his gun over a log, striking the hammer and causing the gun to be discharged. The load struck just above Adam's apple, taking off part of the windpipe, tearing out the sublingual and submaxillary glands and the base of the tongue, lodging in the right parotid gland and broke the lower maxillary at the angles on each side and about half an inch of the symphysis on the right side. I took charge of the case at the sixth week, finding the mouth badly diseased and the discharge very offensive.

The first thing I did was to wash the mouth with an antiseptic until thoroughly cleansed. The parts were then set in place as they best could be under the circumstances, the osseous substance having begun to pour out. As he had a full set of lower teeth, I wired the teeth together so they would hold broken parts in place until a J. & L. No. 14 impression tray could be crimped to fit teeth. The tray mentioned is trough shaped and the first thing done was to cut out the bottom in front section of the

tray so that the modeling compound could come through, also cutting handle almost off so it would be easy to remove. This tray was then tried in mouth and the edge crimped until it fitted the teeth all around the arch and just allowed the edge of the tray to come to the gum margin. Following this, the modeling compound was warmed over the spirit lamp until very soft. Placing it in the tray while plastic I was ready to press down on the teeth. The compound was allowed to come through where the bottom of the tray was cut out and extend up say a quarter of an inch; the lower jaw was then pressed up and indented upper front teeth in the modeling compound. This gave room for the patient to feed himself from the sides and to use an antiseptic wash. When the modeling compound had hardened I bandaged so the patient could not move the lower maxillary and allowed it to remain so for three weeks, using in the meantime an antiseptic wash twice daily, thus keeping mouth thoroughly cleansed. This case was a success, except that the alveolar separated from the maxillary bone with the central and lateral incisors on right side and came out between the broken place and the symphysis. The patient could never speak distinctly afterward. He died five years later of consumption.

Another case was a young man 28 years of age, who came to me with his lower maxillary broken at the symphysis. The first thing done was to wire the teeth together and remove the wire when appliance was in place. I then cut two blocks of wood one inch long, half an inch wide and about one-eighth of an inch thick, hollowed out the centers so the modeling compound could come through and cover each side, using one for each side of the maxillary. Modeling compound of very soft consistency was placed over blocks, and after setting to place on lower teeth, I pressed lower jaw up until lower and upper molars indented themselves in compound. This enabled patient to feed himself in front. This compound was permitted to harden, a chin cup was put on and the lower maxillary bandaged so that it could not be moved at all. I kept the mouth well washed with antiseptics and allowed the bandage to remain three weeks and then removed finally.

Another case was that of a lady 65 years of age, who fell down a flight of stairs and broke her lower maxillary at the angles on

each side and at the symphysis, also driving the condyles out of socket on either side. Being of this advanced age and, also, having worn false teeth since she was seventeen, her lower maxillary was absorbed until very thin and small. I first removed the two front blocks from upper and lower plates, then filed down plates where blocks had been removed until sufficient space was afforded through which she might feed herself. She was then placed under the influence of chloroform until the muscles relaxed. Following this, parts were placed together, and a lower impression tray filled with modeling compound pressed down on ridge until perfectly adapted. This was removed and excess compound cut away. The upper artificial plate was next fitted in place and then the lower. The next step was the placing of warmed compound between the molars of the upper and lower plates, and pressing upward the lower jaw until teeth were well indented in compound.

Feeling under lower maxillary to find that all parts were in place, I then warmed some more compound and made a cup to fit the chin extending up to the condyles so as to hold all in place. This cup was well padded with cotton and fitted to place, the whole then being bandaged so that she could not move maxillary at all. The bandage was allowed to remain four weeks and then removed, the case showing most successful results. In the interim the patient's mouth was kept well washed with an antiseptic. In eight weeks I made her a full set of teeth.

The last case to be described is that of a young man 19 years of age, manager of a telephone exchange. He climbed to the top of a pole and strapped himself to same. On stripping it of all wires the pole fell, with him beneath. It fell across his face, mashing bridge of nose flat, knocking out the two central incisors above, bursting the upper maxillary loose from its adjoining bone and breaking palate bone in several pieces. The lower maxillary was also broken between the first and third molars on the right side; the second molar being out, the other two had come close together. The lower maxillary was broken close to the symphysis on the left side. The condyles were burst from their sockets on either side and the coronoid process was broken, while the lower maxillary had been driven back one inch. The patient could not speak nor swallow and the throat was

very much swollen when I took charge of the case, forty-eight hours after the accident had happened.

First, the condyles were returned to sockets so he could speak, and the clogged blood was washed from mouth and palate and the mouth thoroughly cleansed with an antiseptic. With condyles and coronoid process in place I proceeded to take impressions of upper and lower maxillaries. After running up the models bands were made with double hooks to fit the teeth on models and with the assistance of Dr. Boyd, additional bands were made for each side. These bands were then set on patient's teeth with cement, the lower maxillary parts were wired together, looping wires over the hooks. After placing broken parts of palate bones in position with the finger, we proceeded to wire upper and lower maxillaries together until the teeth articulated perfectly.

We then warmed modeling compound and covered the wire hooks and bands so as not to irritate the soft tissues that might come in contact with same; this was done on both sides. We then bandaged until he could not move upper or lower maxillary.

In the loss of the upper two central incisors the patient was afforded a place through which to be fed and the parts washed with an antiseptic, which was done two or three times a day. This upper maxillary I could move in any direction I might wish, and in pressing it up to place the blood would gush from the nose. I allowed the appliance to remain in place for four weeks and then removed it to find the treatment a perfect success.

This happened eight months ago and he has never suffered in the least from it since the appliances were put in place, and to-day you cannot tell that he was ever hurt. The only disfigurement consisted in the two central incisors, which were missing, but these were replaced with a piece of bridgework. Strange to say, there was no discharge at all except in one cavity from central incisors and that lasted only two days. No nerves were killed in remaining teeth, as far as I could find. All the teeth seemed perfectly healthy, sound and tight, with no sloughing of the gums.

In all cases you can feel on lower edge of maxillary and find when parts are all in place. I will say that in the nine cases which have come under my care, no two are just alike; nor could I have

used the same appliance on any two of them. Therefore, it is necessary to study each case within itself and make appliances to suit the requirements.

The cases all go to prove that we have no time to lose. If we are not busy at our chairs, we can spend our time no better than in the close study of our books, or work in our laboratories, and try in every way in our power to do something, to be something in our profession, to relieve suffering among men and women, to leave records of original investigations and successful accomplishments, to help lift a noble profession to still grander heights, and to so live our lives in our day and generation that when we lay down the instruments of our calling, as we all must do, "We go not like a quarry slave scourged to his dungeon, but sustained and soothed by an unfaltering trust, to wrap the drapery of our couch about us and lie down to pleasant dreams."

THE TREATMENT OF SUPPURATIVE AFFECTIONS OF THE FACE AND NECK EMANATING FROM THE MOUTH.

BY M. I. SCHAMBERG, D.D.S., M.D., PHILADELPHIA, PA. READ BEFORE
THE SECTION ON STOMATOLOGY, AMERICAN MEDICAL ASSOCIATION, 1905, AND PUBLISHED BY COURTESY OF THE
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Early in the history of medical science, surgeons realized that to render the human economy a service meant to imitate and to anticipate nature's own method of disposing of disturbing elements. Thus the evacuation of pus whenever found within the body became one of the cardinal principles of surgery.

Suppuration is a cleansing process, an effort to throw off a virulent irritant. Unaided, the vital forces will ultimately effect an evacuation of a pus cavity, but the method is slow and is attended with certain dangers, prominent among which may be mentioned a change in the integrity of the surrounding structures.

For a long time, the use of poultices which would bring boils "to a head" and cause abscesses "to point" was considered proper treatment. Now, most surgeons advocate the prompt evacuation of suppurating areas as soon as the presence of pus is determined.

Why many should fail to apply this more advanced method of treatment to abscesses associated with the teeth and jaws it is difficult to say. There is no part of the body surface where a scar following the rupture of an abscess is more disfiguring than on the face or neck, and yet how often do we meet with extensive suppurations in these regions which have been encouraged by the use of the hot water bag or the poultice. Unfortunately, relief from pain is frequently effected by the application of heat to the face during attacks of dentalgia and patients are ever ready to apply this treatment. It, therefore, becomes the duty of medical and dental advisors to discourage this unwise practice, for most affections about the jaws which can be relieved temporarily by heat are suppurative in nature.

The larger proportion of pyogenic infections of the face and neck, save those which occur through the skin, emanate from the mouth. The throat and nose are occasionally the seats of initial infections which spread to other parts of the face; but the oral cavity proves to be the most prolific source for the invasion of pus-producing organisms. This is evidently due to the fact that the teeth, by virtue of their presence in the mouth and the various diseases to which they are subject, invite the lodgment of food and other oral débris and transmit infections to the deeper structures. Edentulous mouths are seldom troubled with extensive suppurative processes. It is true that pus organisms may gain entrance into the tissues through wounds within the mouth, by way of the ducts of the salivary and mucous glands and by direct absorption, but such infections are unusual and are of serious moment only in patients with markedly debilitated constitutions.

Suppurative parotitis and other deep-seated infections which have no etiologic relation to the teeth are usually handled intelligently by the general surgeon, and, therefore, will not be considered at length in this paper.

So often do patients present themselves with swollen faces indicating suppurative foci in the superior maxillary, inferior maxillary and submaxillary regions in which the symptoms of tooth involvement are obscure, that a careful examination of the mouth becomes necessary for the proper detection of the underlying trouble. It must be remembered that the exciting cause of a maxillary, palatal, pharyngeal, tonsillar, buccal or cervical disease may be located in

or about a tooth and that the successful treatment of any suppuration is dependent on the true recognition of its etiologic factors. Some of the most usual abnormalities about the teeth which cause a breaking down of the adjacent tissues are the apical and peridental abscesses, and these are occasionally difficult of detection until such time when a fistula is created or the parts become swollen. A putrescent pulp in a tooth with little evidence of its presence has been known to produce maxillary troubles of considerable magnitude. Ofttimes a pyorrheal pocket may go unobserved for some time and may cause involvement of the nearby tissues, and, secondarily, of the lymphatic glands. It is evident, therefore, that to properly treat suppurations which take place about the face, a just regard must be given mouth conditions which may be active in causing such infections.

Another class of cases is that in which infection takes place in distant parts through the lymphatics. During the past year a number of patients came under my observation in whom the lymphatic glands of the submaxillary and cervical regions had become enlarged through infection which took place about impacted third molars and from other pus areas in the mouth. These conditions in themselves appeared to be of little consequence and might readily have gone unobserved had not a careful examination of the mouth been made. Inflammations spread very rapidly to the deeper tissues from pockets formed about lower third molars and may extend to the throat, leading to suffocation as a result of an inflammatory edema of the glottis. A case in which the throat was so badly swollen as to interfere with respiration came under my care last summer and received prompt relief by the removal of a crowded third molar. When inflammation extends to the temporomaxillary articulation, the examination of the mouth is frequently rendered difficult through fixation of the jaw. In some cases in which the lymphatics become involved, the glands are so badly overworked that they break down and require surgical means of ridding them of their contents. The suppuration of the neck in two cases seen by me during the past winter was so extensive as to suggest Ludwig's angina. In fact, it is not unreasonable to suppose that in most, if not in all cases of Ludwig's angina, the avenues of infection, if sought for, might be located within the mouth. The statement made by many authors that such cases usually occur after typhus fever and

other debilitating diseases, merely substantiates this belief, for during the course of most protracted fevers unless the greatest care is given to cleansing the mouth it will be found to be in a deplorable state of filth.

The treatment of suppurative affections of the face and neck which emanate from the mouth may be considered under the heads of preventive, abortive and curative treatment.

Prophylaxis: Preventive treatment consists of the proper attention to the care of the mouth and teeth. The scope of this work is so broad as to include all departments of dentistry. It would, therefore, be manifestly impossible, as well as inadvisable, to deal in this short paper with all that might be embodied in the practice of oral prophylaxis. Suffice to say, that if all mouths were to receive a reasonable amount of intelligent care in the hands of competent dentists and if this work were supplemented by the patient's personal attention to oral cleanliness, many of the extensive suppurations about the face and neck would be averted.

In connection with preventive treatment too much stress cannot be laid on the importance of curing every abscess, checking the pus discharge in every pyorrheal case and removing other infective foci, even though the loss of teeth is thereby necessitated. An emphatic stand must be taken in this regard for the reason that the prolonged retention of uncured teeth not alone endangers the integrity of the surrounding tissue, but oftentimes makes the patient liable to constitutional disorders of a more or less grave nature.

Abortive Treatment: Abortive treatment is applicable in cases in which there has been little suppuration, and is dependent primarily on the removal of the cause, and secondarily on the institution of such measures as will check the inflammatory changes which have taken place in the tissues, and thus aid nature in restoring the parts to the normal. The intermittent application of cold compresses or the ice bag has proved to be of considerable value in reducing the inflammatory swellings about the face and neck, and has frequently prevented the breaking externally of abscesses in these regions. While a cold application to the face does not afford the comfort or relief from pain that heat does, its tendency is to prevent rather than to encourage suppuration. Ichthyol ointment and other similar preparations are occasionally of value in mild inflammations affecting the soft tissues of the face and neck, but

have the disadvantage of acting like a poultice when pus has already formed. In all cases in which an infection is known to have occurred from within the mouth, the patient should be instructed to use with regularity a good antiseptic mouth wash. If the lymphatic glands of the neck have become enlarged, the therapeutic application of the x-rays will be found of service in reducing them. In all cases, when enlarged glands of the neck have not disappeared after the initial trouble has subsided and when other methods of treatment have failed, the x-rays should be given the opportunity to cure before resorting to excision. X-ray treatment in my hands has been a valuable adjunct in dealing not alone with enlarged glands, but with many suppurative conditions about the face, including alveolar pyorrhea.

Curative Treatment: Curative treatment consists primarily in the evacuation of pus so soon as its location is determined. If the case is seen early, this can usually be done by incising the abscess from within the mouth. If the disease is at the end of the tooth and has not yet passed through the alveolar process and drainage cannot be readily accomplished through the root canal, the abscess can be reached by piercing the process with a spear-pointed drill.

The extraction of the tooth at fault is usually followed by relief and little or no subsequent treatment is necessary in the vast majority of cases to effect a permanent cure. The sacrifice of a tooth is justifiable in cases in which the patient's life or health is put in jeopardy by its retention, or when the removal of a tooth will obviate the necessity for draining an abscess through an external opening on the face or neck.

When once the decision is reached that a tooth will be of no further service to the patient, or that its removal is essential to the cure of an abscess, no time should be lost in relieving the patient of the offending member. The antiquated method of awaiting the passing of the acute stage is without justification, and this practice should be condemned as obsolete and pernicious.

Removal of teeth will not, however, invariably effect a cure or adequately drain an abscess. Recognition must be given to cases in which the pus has burrowed its way through a small fistula in the jaw bone and set up a more extensive abscess in the soft tissues beyond, as sometimes occurs in the infraorbital region above and in the submaxillary triangle below.

Abscesses from the upper teeth which spread to the roof of the mouth or infiltrate the cheek can be readily evacuated by incisions made within the mouth. Many abscesses in the lower jaw can likewise be opened into the oral cavity, but when, as sometimes takes place, the pus has reached the submaxillary triangle, the extraction of the tooth or an external opening on the neck become necessary.

In operating on abscesses of the face and neck which require external openings, large incisions are seldom, if ever, warranted. For some time I have been using a trocar and cannula in place of the knife for puncturing these abscesses. The pus will readily drain through the cannula. As soon as the trocar has been removed, a small piece of rubber drainage tube with mural apertures can be inserted in place of the cannula and allowed to remain until all pus discharge has ceased. The resultant scar from this surgical method, in most cases, will prove to be nothing more than a submaxillary dimple, and in some instances is no more conspicuous than the average pock mark. In all these cases every effort should be made to produce as little facial disfigurement as possible, and the method of operative procedure which has just been outlined will do much to overcome the unsightly scar that follows the gaping wound that many surgeons make. A very small opening with a trocar and cannula, followed by curettement and the insertion of a small-caliber drainage tube, will be sufficient to assist nature in ridding itself of the most extensive abscess that appears in the regions referred to.

It might be well to keep in mind the necessity for passing a safety pin through the outer end of the tube, or for adopting some other means to prevent its being lost in the abscess cavity.

A large, wet bichlorid of mercury dressing applied to the part and held by an oblique bandage will prevent the tube from slipping out and will catch the discharge from the wound. It will be found necessary to shorten the tube as the swelling subsides. The daily change of dressing and syringing of the abscess through the drainage tube will be followed by a cessation of pus-discharge within a week or two. The tube may then be removed and the wound allowed to close. During its healing, an ichthyol ointment dressing will act as a convenient protection. If the induration of the subcutaneous tissues and the enlargement of the glands are slow to

disappear, the x-rays might be applied to hasten the resorption of the inflammatory infiltrate.

DISCUSSION.—*Dr. John S. Marshall*, San Francisco, said that he recently had a case of infection either from a hypodermic needle which had not been properly cleansed, or else the cocain solution had spoiled. The operation was performed by his assistant during his absence, and when he returned the patient had a bad infection abscess in the maxillary triangle. Cocain had been used for the extraction of a tooth. Of course there is the possibility of infection having come from the tooth itself, but it was so much further forward than the location of the tooth that Dr. Marshall was inclined to think infection came from the injection of cocain.

A patient with a badly swollen jaw consulted Dr. Marshall, who could find no tooth on that side which could by any possibility have been the cause of the trouble; on further examination he discovered an ulcer under the tongue near the base, and could form no other opinion than that this abscess was caused by absorption through this ulcer. Both of these operations had to be external. In the first case he removed at least a teacupful of pus; in the other less. He was called to see a patient with an impacted lower third molar with tremendously swollen face and neck. He operated and took out at least a pint of pus. That was an infection from the molar. He did not see the patient until long after suppuration had been established, so there was no opportunity for either of these patients to have done anything in the way of prevention. Sometimes these cases result in septicemia. In the case of a man who had a large abscess in the neck, there was a very large swelling, the facial artery having been injured in an operation to evacuate the pus, and later emphysematous gangrene occurred in the location of the ligature, which slipped off in the night and the man bled to death.

Dr. G. V. I. Brown, Milwaukee, said that to him there is nothing more puzzling than to know when to make an opening from the outside, and just what kind of an opening. He said that it sounds like a confession of weakness, but it is a grave question early in a case whether to continue in the effort to evacuate on the inside, or to operate.

Dr. M. L. Rhein, New York, said that infection proceeded by absorption through the lymphatic glands in pyorrhea, but only when there are other complications than true pyorrhea alveolaris. He

has never known of a simple pyorrhea alveolaris, in which the pathogenic conditions were preceded by absorption. He has always found some subsidiary complication.

Dr. Schamberg maintained that pus in the mouth can gain entrance into the lymphatic channels by absorption. Opening through the canal is contraindicated, except to give vent to organisms before they have invaded the surrounding tissue, and that only when there is no fistula. With wisdom teeth, their prompt removal is the best cure. This treatment is only good in acute cases.

THE ETIOLOGY OF TOOTH AND NAIL CORRUGATIONS.

BY G. LENOX CURTIS, M.D., NEW YORK. READ BEFORE THE SECTION
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Very early in my professional career, the peculiar markings I frequently noticed on the teeth of some of my patients excited my curiosity and I determined to ascertain, if possible, their cause and significance.

These markings, in some cases, were in the form of opaque spots and in others they were latitudinal corrugations somewhat resembling the wrinkles on a cow's horns. These signs were not always present on the teeth of all of the members of the same family. In my researches, I often noticed similar markings on the nails; the lines being both latitudinal and longitudinal. I could not, however, always find these markings on both the teeth and the nails of the same individual at the same time.

I could find but little in medical books or periodicals relating in any way to the subject of tooth markings. References to and descriptions of the pits in the enamel which were supposed in some way to be associated with the eruptive fevers occurring during the period of dentition, and Hutchinson's notches, included nearly everything that had any scientific value. Even now I find but little in addition to what was then given by Hutchinson.

This paucity of literature is undoubtedly due to the widely spread belief that these markings indicate nothing of importance to the

practitioner. Such an opinion I regard as erroneous. They have at least an etiologic place in medical literature and, for this reason alone are worthy of the attention of those who are interested in the general study of causes and effects. They also have other and more practical features of interest—features of which no one engaged in the practice of medicine or dentistry should be ignorant.

It is true that these markings point only to abnormal and interrupted changes in nutrition that occurred perhaps a number of years in the past, when the enamel was soft and impressionable and which, consequently, can have no direct connection with present conditions. But, even so, they serve the very important purpose of revealing and confirming the existence of past diseases, a knowledge of which is necessary to complete the history of any given case. Moreover, they are particularly valuable if detected in their formative stage, because they indicate the origin and nature of the malnutrition which, by proper treatment, at this early period, can be corrected.

After studying and comparing the history of many cases, I became satisfied that the transverse lines on both the nails and the teeth were caused by autointoxication, of which rheumatism is the result, and that they were more plainly developed and perhaps alone present in the more painful varieties of this affection such as lumbago, sciatica, and arthritis, while the longitudinal lines pointed to intestinal indigestion and were especially prominent in colitis, proctitis and hemorrhoids.

It then occurred to me that the corrugations on the teeth of young children might have been caused by an attack of rheumatism from which the mother suffered during gestation. Years afterward, I found this hypothesis to be correct by the discovery, substantiated by ample evidence, that mothers who suffer from rheumatism during gestation bear children whose teeth are corrugated and that the teeth of children who have rheumatism during the period in which the enamel of the permanent teeth is developing are also corrugated.

From these facts I was forced to conclude that the responsible cause of the corrugations on both the teeth and the nails was autointoxication. Autointoxication, as is well understood, results from the absorption of certain toxins, as ptomains, etc., which arise from the intestinal fermentation. These interfere with normal functional

activity, clog the emunctories, pollute the blood stream and produce a substance readily seen in the blood called rheumatic fibrin.

That the autointoxication which occurs from the absorption of these bodies is the cause of rheumatism is a conclusion I arrived at eleven years ago while suffering from an attack of this affection so severe as to render me helpless for many weeks. This opinion was amply verified afterward by clinical experience and research.

Formerly the presence of fibrin in the blood was believed to be compatible with a healthy condition of the system, but now its existence is held by some to have a pathologic significance only and to afford the most reliable means of verifying the diagnosis of fibrinogenous disorders, as apoplexy, valvular disease of the heart, tuberculosis, rheumatism, etc. According to this view even the slight traces of fibrin which some pathologists still maintain is an ingredient of healthy blood are really due to the prodromal manifestations of disease. The nature of the disease is determined by the appearance and its severity by the quantity of fibrin present.

It is interesting to know that Drs. Watkins and Salisbury claim that the leucocytes produce fibrin after the manner in which the spider spins its web. It is a question in my mind, however, whether these active organisms, instead of creating fibrin as these authors maintain, are not in reality laboring to destroy it. This view is certainly more in harmony with the relation leucocytes are known to sustain toward many other pathologic elements in the blood.

Opaque spots, when found in either the enamel or nails, are also an indication of autointoxication. As the finger nails of some patients are so carefully and sedulously manicured that all signs which would otherwise appear are obliterated, the toenails, in doubtful cases, should be examined, as they will exhibit similar markings.

The lines on the nails will disappear if the system is freed and kept free from autointoxication; for the corrugations which appear at the matrix to-day will disappear at the tip in the course of three or four months. When these markings are absent, it is fairly sure that your patient is not suffering with any serious form of either rheumatism or intestinal indigestion.

The fineness or coarseness of the markings correspond with the degree of the severity of the attack, and the position of the latitudinal corrugations determines the date of the attack. If they are found near the end of the nail, it is safe to conclude that the attack

occurred about four months previously; if they are found at the center of the nail, about two months will cover the time that has passed since the attack appeared; if the lines are near the matrix the disease has not existed longer than two or three weeks.

If the longitudinal lines are broken and irregular, they indicate an attack of intestinal disturbance of unusual severity, such as occurs in colitis, proctitis and gout. The position of these angular interruptions in the longitudinal lines, denotes, as is the case with the corrugated lines, the period of time that has elapsed since the attack occurred. It is interesting to note how thin and how brittle the nails become in certain stages of rheumatic affections.

From the foregoing facts and illustrations deduced from clinical experience, it is easy to understand how greatly familiarity with these physical signs will aid the practitioner in making a correct diagnosis of the condition of his patient.

DISCUSSION.—*Dr. M. H. Fletcher*, Cincinnati, said that the markings on the nails are an established guide to physicians, and that they are especially indicative of disorders of the alimentary canal; but any acute wasting disease which so reduces the assimilative processes of the body that destructive metabolism is present for a period of one or more days will cause transverse corrugations in the nails. The number, size and depth of these are determined by the severity and length of time that destructive metabolism is present. Pneumonia, pleurisy, or any acute attack will show these markings as surely as derangement of the alimentary tract. On this principle, *Dr. Fletcher* agreed that autointoxication of sufficient intensity to bring on an attack of rheumatism would show just as quickly as though it resulted in some other form, but he was not prepared to accept the idea that these markings are especially connected with rheumatism any more than with other diseases. Under the same conditions the enamel organ would be affected while enamel is being formed and leave the markings on the teeth. *Dr. Fletcher* said that he did not see how *Dr. Curtis* would know that markings were being formed on the enamel before the teeth were erupted, so that he could "administer proper treatment at this early period."

Dr. John S. Marshall, San Francisco, said that all dentists see those cases and attribute them to some disease occurring in early childhood during the formation of the enamel. One can tell within

six months or a year when these changes took place, and at what period this child suffered from an arrested nutrition or an arrest in the growth of the teeth themselves. A child suffering from measles, scarlatina, diphtheria, in fact, from anything that disturbs the process of nutrition for a time, even a few days, may have marks developed on the enamel. In syphilis also and after the use of mercury cases show more or less notches, which Mr. Hutchinson first described. He first thought that they were entirely due to syphilis, but later he said that the use of mercury to salivation would cause them. These striæ occur in persons suffering from acute rheumatism. Dr. Marshall is in the habit of examining the finger nails of patients, but he has never seen a gouty individual with those striations.

Dr. M. I. Schamberg, Philadelphia, said that there is no doubt, when these striæ appear on the teeth and nails, that it means that during the formation of teeth or nails there has been some defective nutrition. He said that this is evidenced by the fact that these markings occur on the teeth of children from measles, scarlet fever, and other exanthemata of childhood, as well as in syphilis, but he doubted that anyone has been able to find that they are due to any one cause, or that constitutional disease might be diagnosed thereby. The only marking on the teeth that is absolutely pathognomonic when it is typical is Hutchinson's notch, and even that is frequently improperly diagnosed. Other markings only mean that the patient has at some time during development suffered from some constitutional disease which has influenced nutrition. Dr. Schamberg considered that Dr. Curtis' allusion to the formation of these markings in the embryo-child as due to rheumatism indicates that he has not given the subject mature thought for the reason that during embryo life the permanent teeth cannot be influenced. The formation of the enamel takes place in the permanent teeth after birth.

AGAINST IMMEDIATE ROOT-FILLING.—The object of not filling the root at the first sitting is to determine positively that all particles of organic tissue have been removed. Where the pulp is alive it is impossible to be sure of this at the primary operation, because the contractile property of the cocain preparation is so great that it frequently only temporarily effaces some minute portion of living matter. On the other hand, in putrescent pulps it is frequently impossible to determine at the first sitting how far infection has proceeded.—M. L. RHEIN, in *Pacific Gazette*.

Digests.

A RESUMÉ OF THE STUDY OF SALIVA. By Samuel Doskow, D.D.S. In the human economy there are in connection with the general apparatus for the carrying on of the metabolic process, two systems that play a great part in the proper performance of that process. One, occupied in the formation of substances that do not preexist in the blood and are employed for the purpose of serving some ulterior purpose in the economy, and which bears the name of secretion. To this class belongs such substances as saliva, bile, pancreatic juice, etc. The other tends to rid the economy of waste and injurious materials that are called excretions. The constituents of this class are urine, feces, sweat, etc.

Under normal circumstances, i. e., when the food ingested is the proper amount, proper kind, and properly assimilated, both the secretions and excretions will be in proportion as regards both the quantity and composition. But when the normal is not realized, either through some fault on the part of the food or through some impairment of the digestive apparatus, the functions of both the secretory and excretory processes will be interfered with. Hence, if on examinations of the secretions or excretions, they are found to deviate from the normal, the conclusion of the existence of a defect in the metabolism of the economy is a natural corollary.

In a paper read before the Odontographic Society of Chicago, February 16, 1903, Kirk likens the human economy to that of a furnace; that when there is a lack of proportion between draught and fuel, the energy produced by it will not be the kind nor amount desired for the accomplishment of the work intended by it; also that the products and waste of the combustion from that furnace are good indicators in the hands of the chemist for the determination of its condition.

In the body, the alimentary tract plays the part of the furnace; the fuel is represented in the food ingested; the draught is furnished by the secretions; the parts absorbed by the blood represent the energy created, and the waste is found in the excretions.

This analogy falls short in this one respect, that while in the mechanical furnace the furnace itself has no influence over the

place of supply of the draught, in the human economy this influence is brought about in an indirect way. For instance, should the food ingested be in some way inimical to the lining of the stomach, the effect will be that the secretions of the pyloric and cardiac glands of that organ will be greatly modified. A like effect may in turn be brought to bear on some of the larger glands. The effect then becomes double; the glands affected will produce a secretion that is not fully capable of performing the function intended, and it in turn further disables the activity of the digestive tract.

The above illustrations give proof to the statement made in the earlier part of this paper that the compositions of the secretions and excretions of the body are determining factors of the metabolic activity of the economy whether it be normal or not.

Having established the proof that the secretions and excretions are reliable means for the determination of the normal or abnormal states of the economy, I shall now devote the rest of my paper to one secretion of the body, although it has not been regarded heretofore of diagnostic value; still, from the part it plays, its relation to the general metabolic activity, and especially in view of some researches that have been recently made, I think it is worthy of consideration. This secretion is saliva.

In looking over the history of the subject, we find that the study of it dates as far back as 1838, when Dr. A. Donné published a treatise considering saliva as a means for diagnosing certain diseases of the stomach. He was followed by others, but it was not until 1884 that the first treatise of importance came to light. I refer to the work of Dr. Binet, entitled "*Etude sur la Sueur et la Salive.*" He wanted to know what were the substances contained in sweat and saliva under normal conditions; also the relations existing between them. In 1900, Dr. Joseph P. Michaels of Paris presented before the Third International Dental Congress a large thesis—*Sialo Semeiology*—of careful systematic observations made during a period of six years. He introduced the use of the micro-polariscope for its examination. The advantage gained by it is that the light is changed from a ray radiating in all planes to one that radiates only in one plane as if passing through a grating. By that means he was able to detect crystalline substances that are not detected by ordinary light. About

this time Kirk took up the study of this subject. He was at once confronted with the difficulty that the salts were very minute owing to the colloid substances in the saliva, and that although they presented a beautiful view for observation from the point of view of the antiquarian they did not present sufficient characteristics for the determination of their exact composition. To overcome this difficulty he determined to remove the colloid substances from the saliva so that they should not interfere with the proper crystallization of the salts. This was accomplished by means of a dialyzer especially constructed for this purpose. As a result of this, a definite work was done on the composition of saliva in relation to erosion: "The Clinical and Chemical Study of a Case of Erosion, March, 1902;" its diagnostic value: "The Saliva as an Index of Faulty Metabolism, February, 1903;" its relation to caries: "The Predisposing Factor in Dental Caries, March, 1903."

Saliva is a mixed fluid that is secreted into the mouth from various glands situated in the proximity of the oral cavity through their respective ducts. It assists in articulation and deglutition, and plays an important role in the first stage of digestion. It converts the starches into sugars; first into dextrin and maltose, later converting the dextrin into maltose. According to Michaels, normal saliva should be transparent, clear, bluish in color, possessing neither taste nor odor, neutral in reaction, diastasic, containing sodium chlorides, but no polarizable salts.

Regarding the above as a standard guide we determine that any deviation from it means abnormal saliva. From observations made by Michaels it was found that certain characteristics of the saliva exist under certain metabolic conditions. It was also found that those characteristics are constant under similar diathetic conditions in different individuals. It was further observed by Kirk that the development of a certain abnormal metabolic condition is in a graded scale beginning with the element most abundant and easier dispensed with, and further, that in the treatment of that condition for the restoration of the economy to the normal the replacement of the elements lost is in the reverse order of the graded scale. This establishes beyond doubt the reliability of the saliva as a means for the determination of the different oscillations in the economy when external relations are not in

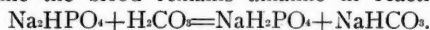
accord with internal relations in whatever phase it may be manifested.

The disposition of the economy toward the gradual development of abnormal metabolic conditions, thereby lessening its vital resistance to the attack of specific disease, known as diathesis, is subdivided into two distinct heads: That condition in which the oxidation process is over-active, resulting in a decrease of organic acidity with a corresponding increase in saline chlorides excreted by the economy, is known as hypoacidity. This condition renders the body favorable for the development of various contagious diseases, such as scrofula, tuberculosis and syphilis. Fortunately this condition is not prevailing, or else the fate of the civilized races would be in as sorrowful a state as some of the Indian tribes on our borders, who resort to the adoption or acquisition of white children, so that the extinction of their tribes may be thereby prevented. The other diathetic condition is the reverse of the former. It is characterized by an under or sub-oxidation in the metabolic process; a general slowness in the biochemical changes; the gradual deposition of acid salts in all the articular tissues, and especially in those most active; the increase of organic acidity as a consequence. It leads to the development of gout, rheumatism, sclerosis, etc. According to Gautrelet and others, if the amount of waste products distributed through the blood-plasma and its constant increase be taken into account, the blood in this condition should be regarded as decidedly acid in reaction. It approaches senility. Many individuals are found to-day that, although young in age, are really old as far as their metabolic activity is concerned. This diathesis is termed hyperacidity.

The composition of the saliva under the different diathetic conditions varies with the degree or period of the diathesis. In the hypoacid diathesis, the saliva, according to Michaels, is usually abundant in quantity, opalescent, of fluid consistence, white, insipid, of nauseating odor, actively fermentative, alkaline in reaction and contains crystalline ammoniacal salts. Caries of the teeth is most abundant in this diathesis. Our experience with this kind of saliva is very limited, and I shall therefore leave it and consider more fully the saliva of the hyperacid diathesis.

As stated above, hyperacidity is characteristic by a slowness in

the biochemical changes of metabolic activity, resulting in the deposition of the various crystalline salts throughout the course of the blood-plasma. The casting off of the various elements from the economy is in a slow, gradual way, beginning with the element most abundant and easier dispensed with. The elements affected, and which are at the basis of the chemical construction of the body, are sodium, calcium and magnesium. The acids connected with the precipitation of these elements that afterwards are dialyzed through the glandular structures and appear in the saliva are: phosphoric, lactic and oxalic acids. The first installment of salts that gives the indication of the existence of the diathesis in question is the phosphates of sodium, first appearing as neutral phosphates and later as the acid-sodium-phosphate. The appearance of this salt in saliva is noteworthy, inasmuch as we know that this salt in small quantity is a normal constituent of the urine. The presence of a salt that is a normal constituent of the urine has no place in normal saliva. The action of the renal epithelium upon the blood when it reaches the kidneys produces the reaction forming this salt, thereby giving the urine its acid reaction, while the blood remains alkaline in reaction.



With the advent of the diathesis, when the supply of sodium has been largely depleted the calcium is affected, and we will first get the combination of sodium and calcium and later pure crystals of the calcium acid phosphate. The condition of the teeth at this stage depends upon whether they were affected by caries prior to the development of this stage. Usually there is an absence of caries, for when the saliva reaches an acidity of this strength the development of bacteria is almost impossible. But should the teeth have been affected by caries prior to the development of this diathesis they will present certain characteristics that in themselves are determining factors. The carious matter assumes a dark brown color, of a semi-hard texture, and when the bur is applied it crumbles away like dried rotten wood. Unlike teeth that are in an acid medium, they are almost devoid of sensation. The destruction of the teeth does not seem to cease with the cessation of the development of caries; on the contrary, destruction proceeds, but from a totally different cause. They are, so to say, dissolved out.

A striking illustration of this kind presented itself at the clinic of the University of Pennsylvania, and upon careful study much valuable information was derived from it. The patient was a young man of about twenty-five years of age. Almost every tooth in his mouth was decayed. The condition of the decay was like that described. On examination of his saliva it was found to contain very large crystals and a large quantity of acid-sodium-phosphate. He showed every condition of approaching old age, and, judging from the amount of phosphates in his saliva, it was concluded that he was a phosphorous diabetic. He was instructed as regards habit and diet and phosphorus was administered to him in various ways and in varying doses. In a comparatively short time he showed marked signs of improvement. Unfortunately we were not able to follow this case to completion, but we learned from the student who had him in charge for the treatment of the disorders about the teeth, that he was following the instructions as outlined to him in the laboratory and faring well.

Following up this stage in regular order come the lactates. We first have the lactates of sodium, then of calcium and magnesium. Later come the double lactates of sodium and calcium. Then we have the combination of lactates and phosphates, such as the lacto-phosphates of calcium and lacto-phosphates of magnesium. These crystals are very rich in color when viewed by polarized light, and possess definite outlines distinct from any family of salts. The action upon the teeth is very marked. It is here that we have that class of erosion that was named by Kirk as the general erosion in contradistinction to the localized erosion that is caused by the sodium-acid-phosphate from some of the buccal glands. A systematic study of this subject had been presented by Kirk before the Second District Dental Society of the State of New York in the paper referred to above.

The third stage in the development of this diathesis is the appearance of the oxalates. So far we have only met with the oxalate of sodium. The appearance of this salt is usually a signal of nervous debility, and in many cases complete derangement of the nervous system. There are many cases to which I can refer that were analyzed at the laboratory, diagnosis determined, and for whom valuable aid was rendered towards restoring them to the normal. I shall, however, quote only one case, that I may say was

nipped in the bud, and which is under my observation almost every day. The case is that of a young man of about twenty-two, who complained that his appetite was not as he thought it should be and that he feels as if something was lacking. Examination was made of his saliva and urine, as is done in every case. It was found that in addition to the few diacid-phosphate crystals he had a large number of the sodium oxalates—thus proving that he was drained of his phosphates to a large extent and that his system was manufacturing oxalic acid and assisting the phosphoric acid in its destructive activity as well as acting as a toxic irritant. A diet was prescribed to him, barring all carbohydrates and such vegetables as help in the formation of oxalic acid. In addition to this he was ordered to drink hot water as many times during the day as he was able to manage and a tonic of phosphorus and arsenic in small doses, in the form of a pill, taken three times a day. He continued taking the tonic for about three months, but he is still adhering to his diet. He has since gained in health, his weight has increased and he assured me many times upon questioning him in regard to it that he could not expect to feel better.

The oxalates appear sometimes as double oxalates of sodium and calcium, while the oxalate of magnesia is often found in urine. When this occurs the indications are that the individual is sliding down a steep slope, and unless efforts are made to prevent him from landing in the pit, serious complications will follow.

I acknowledge my indebtedness to Prof. Edward C. Kirk, who first advised me to follow this line of study. His personal instruction and direction in the laboratory helped to inculcate into my mind the comprehension of the vast scope of this work and to what extent mankind in general could be benefitted by it; also, that there is a domain in dentistry in addition to that of filling teeth and the making of artificial appliances for the restoration of the lost organs, important as those may be. The study of prophylaxis could not in any way be undertaken or understood, unless the system is studied in a systematic and scientific manner.—*International*.

CARE OF THE DENTAL TUBULI UNDER FILLING MATERIAL. By F. S. Trickey, D.D.S., Freeport, Ill. Read before the Southern Wisconsin Dental Association, May, 1905. It is not the purpose of this paper to make any suggestions in

regard to cavity preparation, or to emphasize anew the necessity of correctly beveled and perfectly polished enamel margins, taking it for granted that these essentials are fully accepted by all practitioners who are enough alive to be in attendance at a dental convention. But to rest assured that the ideal has been accomplished for our patients, when the filling is completed with all enamel margins polished to a perfect surface (without a visible pit, even under the magnifier), is often a snare and a delusion.

How many times have we dismissed our patient with this nicely finished work, labeled it "a thing of beauty," and then at a later date been surprised to have convincingly revealed to us that it has not proven a "joy forever."

Have we fully understood all the sources of destruction to these monuments of our professional skill, or are there foes for us to fight, of the presence of which we are unaware? In facing the many failures that come under our observation in daily practice it seems very reasonable to decide that there is real need for more improved methods.

The presence of the dark line so prevalent wherever cohesive gold or amalgam comes in direct contact with the dentin, leads us to question the continuance of such practice without some protest, and is certainly grave enough in its results to demand our most careful attention. Is not this conclusive evidence that these materials are incompatible with tooth structure when placed in this relation? I think this point is quite fully conceded by the dental profession in general.

If so, in the face of the extensive daily use of these materials in such relation, is it not time to begin to hope that some Saul of Tarsus may become thoroughly enough converted to stop, study into and solve this problem and show us a more excellent way?

The constant investigations and new discoveries in both science and practice make it very aggressive on the part of any practitioner to declare flatly that his deductions are absolutely true.

The anatomy of the dentin of the tooth, however, reveals not only the possibility, but the probability, that a needed attention has been sadly neglected just before commencing the insertion of the permanent filling material. In cutting the tooth substance either with hand excavators or burs driven by the engine, all dental operators are aware—and their patients are generally much more aware—that this part of the anatomy is very much alive.

Countless numbers of dental tubuli must be severed in the preparation of the cavity, and this living tissue is placed in contact with a filling material which makes harmonious existence impossible here until the struggle ends in a death or a destruction, the evidence of which is the dark line above mentioned.

We are all convinced beyond any doubt that this line of discoloration may be overcome. It has been proven to us by many a non-cohesive gold filling, some that have done service for nearly half a century. We may not consider them artistic from our modern viewpoint, but no dark lines mar their margins and they continue to preserve the teeth with comfort to their possessor. It has been proven to us by guttapercha stoppings that have served long and faithfully in most inaccessible locations. It has been proven with fillings of tin that have been carefully and judiciously inserted, and the eradication of the dark surrounding line has been most thoroughly demonstrated by the use of cement, and while we know it to be a very temporary filling, washing and dissolving out very rapidly, yet its margins are ever free from discoloration. It is one of the most, if not the most, compatible filling materials that it has ever been the dentist's good fortune to use.

If it has none other than this one redeeming quality of compatibility, which is not possessed by either cohesive gold or any of the alloys, is it not well worthy of our most considerate attention as a cavity liner, to cover the dentinal surface and protect these live tissues from the harsher filling material? I contend that it is, especially so since it can be easily introduced and renders so perfectly in this position the very service for which we are in search.

Several years of careful experiment and observation have convinced me that the right quantity of cement mixed to a proper consistency, placed beneath gold foil in the cavity and subjected to a pressure sufficient to weld the gold, will so perfectly seal the dental tubuli that we may entirely prevent the black line of discoloration so prevalent between cohesive gold and the tooth substance when the cavity is unlined.

Like results are just as easily and positively reached when used under an alloy, by carefully and thoroughly burnishing a small amount of the filling material over the entire dentinal surface of the previously cement lined cavity.

I believe the claim made by some operator that cement will prevent amalgam from shrinking away from the cavity wall is accounted for wholly on the theory that the thin cement lining so perfectly seals the dental tubuli that peace and harmony are permanently established.

The mistake that the inexperienced invariably makes with cement in this relation is to use too great an amount. He cannot believe that the small portion necessary to perfect work is sufficient for his purpose. In this connection I repeat from a previous paper in reference to my mode of operation.

I prepare all cavities in the same manner as I would if no cement were used, not relying in the least on the cement anchorage to hold the finished filling in place. When all is in readiness for the filling, I mix the cement to such a consistency that a small amount of it will drop quite readily from a common nerve broach, and with this broach I carry it into the cavity. My reason for using an instrument as fine as a broach for this purpose is because the amount that clings to it is so small that I am enabled to carry it to the floor of the cavity without smearing the side walls.

With my broach (very large cavities for gold excepted) I now spread the cement over the entire dentinal surface of the cavity. I am then ready for the immediate insertion of either gold or alloy as preferred.

If for gold I usually place the proper sized pellet of unannealed foil in the cavity and press lightly to place with one of several pluggers that I keep for this special work. I now place over the first pellet Watts' Crystal gold and press all firmly home. I prefer the foil immediately over the cement, because it does not readily tear under the crystal form when subjected to the pressure necessary to welding, and thus the mixing of particles of the soft cement through the filling material is entirely obviated. As soon as enough crystal gold is built in to perfectly anchor the filling and insure firm and constant pressure on the cement lining, I carefully examine and remove any particle of cement that may possibly have squeezed up around the gold. When assured that all margins are clear I change pluggers and proceed to anneal my gold and finish in the ordinary manner. In large gold fillings it is sometimes necessary to make more than one mix of cement, the second being placed in the cavity after the first part of the filling is inserted.

For alloy fillings the procedure is the same; small pieces of the filling material are thoroughly burnished into the cavity lining until firmly anchored as noted above. Now all margins are carefully examined and cleared from overhanging material. If desired I then adjust my matrix, or proceed to complete the filling with no further regard to the cement.

A few negatives in conclusion: Do not expect cement to do all manner of impossible things. Do not daub a large body of cement under any material and then condemn the practice because this one was a failure. Do not embrace the doctrine that if the tooth is foreordained to be saved it will be saved, and that if it is foreordained to be lost it will be lost, regardless of careful attention to every minor detail on the part of the operator.

With such practice we may succeed in proving our faith by our works, but we shall not prove ourselves to be a blessing to our day and generation in the field of dentistry.—*Dental Review*.

THE PREPARATION OF A CAVITY TO OBTAIN AN ACCURATE MATRIX FOR STRENGTH AND PERMANENCY OF A PORCELAIN INLAY. By W. H. Upjohn, D.D.S., Lafayette, Indiana. Read before the Indiana State Dental Society, 1905. The subject of a porcelain inlay is yet to be settled as to its permanency by many doubting Thomases. When it does become universally adopted it will do much to raise the standard of our much loved dental profession.

The five years past have indicated to us the progress of the next five. As professional men and women, we are in the world of progress to show that we are holding first place with the progressive.

Among the many phases of dentistry that are new and being brought into use very fast, is the art of porcelain inlay work. In this paper will be brought out a few initiatory points for inlay work, with the view of helping those who have done some experimenting or studied on this line previous to taking it up practically in the near future.

In building a house, for comparison, we see to it that a carefully prepared foundation is obtained before the framework is built. On the foundation and framework depends a great deal the permanency of the building. The proper preparation being made, the mechanic

and artist can proceed with their work with the confidence that it will stand the test of time.

With inlay work the first important step is the preparation of the cavity and the foundation properly prepared, with the view of getting a good accurate framework, which is the matrix, to enable the mechanic and artist to build up and carve the inlay.

We must take into consideration the occlusion in the cavity preparation for an inlay, namely, to grind the cavity, parallel with the enamel rods on the occlusal surface, also the incisal edges. When we vary from this rule there is danger of the enamel breaking away next to the inlay, which places the porcelain artist in an embarrassing position, especially if in the incisor teeth. Never finish a cavity at the point of a cusp for an inlay, as both inlay and enamel would break away in this case in mastication. Finish on one side of the cusp, or sacrifice it entirely to a depth sufficient to give the overlapping inlay plenty of strength.

On incisal edges where they are thin, it is deemed advisable to make a step cavity over the incisal edge with a reverse curve for anchorage, avoiding perfectly square steps in view of getting an accurate matrix. A slight step can be cut on the lingual surface for this form of cavity for protection against the pressure of the occluding teeth.

Anchorage.—On the subject of anchorage for inlays there is a rule that holds good in most all forms of cavities. There should most always be two points of anchorage. For approximal cavities in the incisor teeth, including the cutting edge, a slight groove on the gum margin and a step and groove on the lingual to the incisal edge.

Approximal cavities with the incisal edges in good condition are prepared from the lingual portion of the teeth with a groove on the lingual surface, with parallel walls towards the labial, to form a mortise.

For the half-moon-shaped cavities in incisal edges, cut a half circle groove to correspond with the cavity. Labial and buccal cavities need no more anchorage than the solid slightly obtuse angle walls give, except the grooves cut after the inlay is completed, before cementing. Approximal cavities of molars and bicuspid are prepared with parallel walls and slight grooves with a flat bottom. Where the approximal occlusal cavities are found, a step

cavity is indicated when much of the tooth is gone. When the whole of the lingual or buccal portion of the molars and bicusps is gone the step cavity with grooves at the gum margin and occlusal part of the cavity is indicated.

Where the restoration of incisal edges is indicated, platinum pins should be used for anchorage, and for additional anchorage a small groove is cut from the mesial and the distal on the incisal edge of the tooth within one-sixteenth of an inch from the approximal surfaces, and at each end of the groove a hole one-sixteenth of an inch in depth is drilled a size larger than the pins used, so that the latter will not bind in drawing. The length of the pin to extend into the porcelain depends on the size of the restoration, which will be left to the judgment of the operator. The best mode of operating to get the matrix and pins into the proper position, after the incisal edge is ready with the groove and holes drilled, is to cut the pins the desired length, place them aside, and burnish or swage the matrix; when completed, punch holes with a sharp-pointed instrument a size smaller than the pins so that they will fit tightly in the matrix. Now place the pins through the matrix into the holes in the tooth; secure with sticky wax and remove the matrix and pins carefully and invest in powdered asbestos mixed with water or alcohol, on a platinum or fire-clay slab. When dry and the sticky wax is burned off, cool and proceed to build up with the foundation body around the pins, dry and bake to a high biscuit; when cool, build up the second time in the groove and over the pins as high as the foundation body is desired and bake to a high glaze. Finish with the enamel body without removing the case from the investment, unless in doubt about the outer edge of the matrix or the contouring, in which event it can be removed and fitted into the tooth before the final baking.

Incisor Restorations.—There is another form of restoration which I wish to speak of before going further and that is where incisors have a large corner broken off by accident and the nerve is still alive; my method is to prepare the approximal corner for one platinum pin, and a groove at the remaining corner of the tooth.

The platinum pins used for porcelain restorations should be the diameter of long-pin teeth used for bridgework. Any heavier wire would weaken the porcelain. Where step cavities are used for incisors, bicusps or molars, the reverse curves are much stronger

and easier of access for the inlay than right angles. Several of our leading porcelain workers in finishing cavities where the inlay shows on the labial surface, to produce a better joint and hide the line of cement, always very prominent when first cemented, advise grinding the labial edge of the enamel to a slight acute angle, and in placing the inlay in from the lingual portion of the cavity the inlay and enamel edges are going to wedge closer together than where finished without an acute angle from the lingual portion of the cavity. Also, the inlay will have a better edge to it when finished with a slight obtuse angle, otherwise it is apt to chip off and show a rough edge.

The lingual margins can be finished at a right angle with the surface of the tooth. All inside angles and corners of a cavity should be slightly rounded to make it easier of access, so as to get a more accurate matrix. It is extremely difficult to obtain one from a cavity full of sharp right angles. A good fitting matrix means a close fitting inlay. All cavities properly prepared will be easy of access, to allow the easy withdrawal of the matrix or impression without marring, a condition necessary for the insertion of the inlay when completed.

Obtaining the Matrix.—Before preparing a cavity on an approximal surface, the teeth should be well separated. The matrix can be obtained in two ways. By burnishing or swaging. In practice the two methods are used in preparing a single matrix, as will be explained later. We cannot use the one method alone. There are advantages in both.

When the inlay is to be completed at one sitting, burnishing the matrix is the quickest; but when the dentist is busy at other work and wishes to have his leisure time for preparing the matrix and baking the inlay, an impression of the cavity can be taken and the matrix made by swaging. In burnishing a matrix as well as swaging, there are many little points of importance in each step we take in forming the same. The standard thickness of platinum inlay foils is one-thousandth of an inch. In cutting the platinum for a matrix do not be too stingy, but cut large enough to allow plenty of lap as it is not waste of material, but waste of time to cut it too small. The platinum, being very thin, needs considerable coaxing to get into the cavity without tearing. The safest plan to avoid trouble in tearing is to form the platinum into a

cone small enough to touch the bottom of the cavity; then grasp in a ball plier a suitable sized piece of wet spunk and coax the platinum over the floor of the cavity, *beginning in the center, working out and drawing the platinum down*; in the meantime, if the cavity is large enough to permit it, use a second instrument with wet spunk to keep the platinum from rocking while burnishing against the walls of the cavity. When this is done, place a large piece of spunk or swager rubber into the half formed matrix, holding it firmly; pass around the margin of the cavity with the ball pliers and spunk, pressing the platinum over the surface of the tooth from the center of the cavity. After this is done, take out the large piece of spunk or rubber and use Reeves' burnishers; first use one of the half-round ball instruments in the bottom of the cavity gently, hold the matrix with a second instrument to avoid rocking, then burnish the walls with another instrument for that purpose and finish the burnishing with the one to be used on the margin of the cavity; at this point fill the matrix with gum camphor, pressing it in very firmly, until the cavity is filled flush; then talcum the camphor and matrix to keep the tape from sticking to them. Then place the tape over the matrix and apply pressure with a suitable instrument on the camphor and burnish outward over the margin of the matrix as hard as allowable. This will take the rocking condition out of the matrix if there should be any. After this part is completed, burn out the camphor and anneal matrix in the oven. Then replace and reburnish the margins. Remove the matrix with a smooth medium size nerve broach sharpened out and prepared for the purpose, or a small explorer, coaxing it out very carefully so that the form will not be marred. Another method is to use a chipblower to force air under the edges. A drop of water under the matrix will assist the blower in freeing it.

In taking up the swaging process, the impression may be taken of the cavity with Britton's yellow cement or any other cement that will behave as it does. It is quick setting and has a good edge strength, giving a good outline of the cavity. It is mixed medium stiff and taken between the finger and thumb and kneaded, first placing the finger and thumb in the cement powder to keep it from sticking, and when stiff enough not to stick to the cavity, shape it to fit the cavity so that you can see that it is being pressed into

every part of it. Do not dry the cavity, but take away the surplus saliva. The damp cavity will insure the impression not sticking.

Impressions of Cavities.—For taking an impression of an approximal cavity, after pressing it to place with the fingers, use a very thin metal strip to finish, forcing the impression to place, and bend over the tooth and hold the strip with the left hand, and in case it is necessary, press the cement over the cutting edge of the tooth with an instrument or the fingers of the right hand. After the impression is hard enough to move without marring too easily, loosen it slightly to see that it does not stick, and press back to place snugly until it gets hard enough not to bend nor break. If it is an impression of an incisor approximal cavity, and it overlaps the labial surface so that it cannot be drawn, take a very sharp instrument and trim down enough to let it be removed without cutting into the impression of the cavity proper. When removed, examine it to see that it is a perfect impression of the cavity. After a few minutes the impression can be placed in a swager with warmed dentallac or modeling compound, impression side up. Previous to this the surplus cement should be smoothed down on the impression side to allow the dentallac or compound to overlap enough to hold it in place. When hard, oil and dry, then powder with talcum or soapstone. Mix more cement stiff as when preparing for the impression and press over the impression in the lower part of the swager. When hard enough, warm more compound and place over the counter die through the upper part of the swager previously placed into position. Press down firmly with the plunger before the compound hardens so that it will fit over the cement counter-die perfectly. Now we have the impression and reproduction of the cavity before us to work by. After the cement has hardened for half an hour it is usually hard enough to burnish and give the matrix its final swaging. In doing so it is the fault of a great many to hit the plunger too hard. A medium blow with a small sized swaging hammer is hard enough to bring the die and counter-die together over the thin matrix and there will be less danger of fracturing the cement or compound. Soapstone should be used on the die and counter-die to keep the matrix from sticking and avoid trouble of tearing it in the effort to get it loosened. There is nothing that will take the place of cement for swaging an accurate matrix. Dentallac and modeling compound

will change their form in swaging, even as a counter-die, so the matrix is liable to stick to the compound and cannot be freed without spoiling it. Fusible metal, like a child when company is present, is never on its good behavior when you most want it to be. It shrinks when a little bit too hot, and fails to pour well when not quite so hot. It is hard to get just right when it is most needed. Some may learn to use it successfully, but most of us do not, when it comes to the exactness for a matrix in inlay work. A perfect die and counter-die of metal of a cavity would be an ideal swager. When we use cement for an impression, it forms the die and another mix forms the counter-die. What can be better and more accurate, taking everything into consideration, for a matrix swager out of the mouth. The platinum can be treated in the reproduced cavity of cement the same as in the mouth if so desired, or held over the cement impression with a rubber swager while it is being well burnished around the same. Before the final swaging, always anneal the matrix in the oven.

There is another idea that can be mentioned here that should not be lost sight of and that is to take an impression of the cavity, draw it, burnish the matrix, anneal, replace into the cavity and follow with the impression, pressing as hard and firmly as allowable without breaking the impression or tooth. Where this process can be used, it is quick and exact, especially in the final swaging.

In obtaining a matrix it does not pay to get nervous and impatient; by doing so we meet with many failures. It cannot be hurried; we have to calm down and take our time to it. We had better consider time nothing rather than make an absolute failure of our inlay. It is time saved to be slow but sure. Success is gotten only by careful manipulation of the cavity, the matrix and the inlay. It all means very hard work, to the mind as well as the body. There is no soft snap money gotten in the dental profession. We must love our work to enjoy it, let it be ever so hard to do, but do it with your might, trying to do every new piece of work better than the last. Our professional reputation depends upon how we use our ability. A good reputation brings us better prices. A dentist worthy of his hire will never starve. We must not allow ourselves to go backward, but advance to a higher standard in the profession.

Perfection is obtained by continued effort over great difficulties.

Good judgment and a keen sense of the right and wrong way to do a piece of work are the necessary qualifications of a dentist.

There is no kind of a filling perfection within itself when made by the best operators; it is only an effort towards perfection for the preservation of the teeth.

The nearest approach to the natural tooth, in shade, is in the inlay, and that is discernible; it cannot fool the eye at close range. The outline is there, which is not seen at a distance of a few feet, and is hidden in proportion to the thinness and accuracy of the matrix.

We are not making natural teeth, but only restoring lost portions with a material that will match in shade and appearance as nearly as possible for us at present, and that is the porcelain inlay.

Shading the Inlay.—The matrix completed, we proceed to select the shades to go into the inlay to correspond with those in the natural tooth. It is better to make a trial inlay on an old piece of platinum, hurriedly shaped somewhat like the matrix we are about to work on, to give us an idea as to the proper shades to combine to bring out the results desired. With the formula before us for this particular inlay, we can proceed with some confidence in the success of our inlay as to shade, taking care to bake in the same way. When ready for the practical inlay grasp the matrix in a lock plier. Mix the foundation body to a thick creamy consistency, place in the matrix with a carving instrument and jar down by rubbing the carving instrument over the corner of the plier as in the act of filing, and proceed until the matrix is one-half or two-thirds full. Use a small piece of blotting paper to absorb the moisture. Dry perfectly before placing into the oven to avoid porosity by gradually heating until dry and hot.

Before placing in the oven, place a pure gold cylinder by the matrix on the fire-clay slab and push to the back of the muffle; gradually turn on the current until the cherry-red begins to leave the oven, and before the gold melts turn next to the last step, and when the gold melts into a perfect ball count twenty seconds for a high biscuit for the high-fusing foundation body. But before the first baking it is deemed advisable to make a cross through the foundation with a thin pointed instrument (being careful not to mark the matrix). This will overcome the danger of the first bake drawing the matrix out of shape. After the first baking has cooled,

grasp in the pliers again and proceed with more foundation body to fill up the parts where the shrinkage took place; the second baking of foundation body is baked thirty seconds after the gold melts. This gives it a glaze. If only one baking of the foundation is made, it must be thirty seconds.

Baking.—Before I go further with the baking, I will go back to the matrix again. Mr. Brewster has placed on the market a matrix lining which is white with a high glaze and fuses to a glaze in about forty seconds after pure gold melts. The degree of shrinkage is greater than in the foundation body and two bakings are necessary to cover the bottom of the matrix. Before baking it should be separated with a cross incision like the foundation body and refilled for the second baking, then baked as follows: First baking, thirty seconds after the pure gold melts. Second baking, forty seconds.

The lining should be thick enough to shut out the reflection of the matrix beneath it. This will be sufficient to keep the cement from absorbing the rays of light through the inlay. The object in the lining is to reflect the rays of light back through the inlay, as they are reflected back in the natural tooth. This is supposed to give the inlay a more life-like appearance. It does it to a very great extent, but I am not able to say to what extent.

Cement, as we well know, changes the appearance of our inlays to a disappointing degree, and I think the matrix lining will help us out a great many times.

When the lining is used in an inlay, usually but one baking of foundation body is needed; then we can proceed with the enamel body to finish the inlay with the shades according to the formula of the trial inlay. The enamel body is jarred down the same as the foundation and carved to suit the contour of the case. In every baking of enamel, next to the last step on the furnace should be used just before it is hot enough to melt the pure gold. With every baking except the last the current should be shut off just before the gold melts into a perfect ball to give it a high biscuit fuse. At the last baking the gold should be allowed to form into a perfect ball and the current turned off just as quickly as that formation takes place, as four or five seconds beyond that point is liable to over-fuse the inlay, and spoil your intentions as to shade and strength of the same.

The object in not baking or fusing to a high biscuit until the last baking is to avoid over-fusing. It is better to under-fuse and bake again than to over-fuse and spoil the inlay. The shading of inlays to match the natural teeth in which they are to be placed, is quite an art. In one case it will be indicated by baking different shades separately. Occasionally a shade will need modifying by mixing with another to get the desired shade. I have had inlays where I mixed two or three shades together to match a tooth, in one baking. Where I find all the shades too dark, I use Brewster's XX white enamel. It helps one out of many a color scrape.

After completing an inlay it always needs more or less trimming, which should be done from the outer edge towards the center with a fine stone or fine sand-paper disk until the feather edges are removed, which should be done very carefully.

Where the inlay is contoured too much, it should be fitted in the cavity and ground down to the proper contour.

How to Hold an Inlay to Grind.—Most inlays are troublesome to hold in the fingers to grind and polish. A convenient way to do this is to melt sticky wax on the end of a small pine stick, enough to embed the inlay close to the feather edge while the wax is quite warm. Then cool by placing it into a cup of cold water and proceed to keep cool while polishing or it will come loose. While held in this position a very high polish can be gotten with a wooden polisher and pumice or an Arkansas stone. When the polishing is done, warm the inlay enough to get it off the stick, then gradually heat it up in the furnace until the wax burns off. After it is cooled, should it need etching, according to the judgment of the operator, place wax over the outer part where the acid is not to touch. Then apply by hydrofluoric acid with a tooth-pick. After leaving for fifteen or twenty seconds place into an alkaline solution to neutralize the acid. Some use a diamond disk and make a shallow groove in the inlay. Etching or grooving is not necessary in most inlays where the cavity is properly prepared with anchorage.

Before cementing the inlay the occlusion should be looked after and in case the occluding tooth or teeth strike, the inlay or teeth should be ground so that they will not strike.

Before adjusting the inlay, the cavity should be dried and wiped

with cement liquid, also the inlay should be treated in the same way, and the surplus liquid wiped off. This will produce a stronger adhesion of the parts when the inlay is cemented.

In mixing the cement care should be taken not to get it too thin or it will not get hard enough, but mix thick enough to allow the cement to have its full strength and yet give plenty of time to adjust the inlay. The cement should be mixed with a bone spatula to avoid discoloration.

In the past my experience has been that a light green or gray-yellow cement has suited most cases. White might have been better in some cases, but I cannot prove it.

Inserting the Inlay.—Inlays should be inserted into the cavity with the fingers and pressed to place with a wooden or rubber instrument, as a metal instrument is liable to fracture or chip the inlay. When in place it should be held there with a wedge or the wooden instrument until the cement is hard enough to hold after releasing the inlay. One-half hour after cementing a large inlay I dismiss the patient, after removing the compresses; others, so soon as cement is stiff enough to begin to break. Where the inlay has good anchorage and the patient is warned to be careful there is not very much danger of displacing an inlay. One or two days after the inlay has been cemented in, I polish the surplus cement away.

"All is well that ends well." The process of inlay work has been touched upon only partially in this paper. There are many more points of interest that might have been brought out had time permitted my so doing.

Self-satisfaction is seldom granted those who desire to progress in knowledge and professional ability. We must continually work and study. Progress is a never ending battle. So our work is never done to perfectly satisfy us; our standard is just a little higher and the march is continued towards the goal.—*Dental Summary.*

THE PATHOLOGY OF PYORRHEA ALVEOLARIS AND ITS CAUSATION, WITH SUGGESTIONS OF TREATMENT. By W. F. A. Schultz, L.L.B., M.D., D.M.D., St. Louis, Mo. Read before the St. Louis Society of Dental Science, March, 1905. This affection or morbid condition has been called by writers on the subject by various terms, a number of which were

designed to present the view held by their authors concerning the pathology of the disease. It is, indeed, not desirable to comment upon them here; we shall choose to employ the above title only, and such merely for two reasons: first, because the title is so common as to need no special introduction, and, second, because the local appearance and the general conception of the term of the affection suggests a marked contrast to the real pathology. (The author refrains from introducing here a novel style for the disease; therefore, later on, when speaking of non-suppurative pyorrhea, it should be understood to indicate that the morbid anatomy presently to be described is unattended by suppuration.)

Clinically, pyorrhea alveolaris exhibits two characteristic differences of feature—one presents the presence of suppuration, whereas the other type is almost, if not entirely, devoid of such a tendency. The two types are sometimes seen to affect the mouth at one and the same time, while both have a similar or common pathology.

There still exist the two opposing schools, one firmly contending that pyorrhea alveolaris is merely the effect or manifestation of a distinct local irritation or factor, and that consequently its pathology must be a pure inflammation *per se*; the other inclines to regard the trouble *ab initio* as arising from a systemic or constitutional agency, exciting a deleterious action upon the tissues of the alveolar process, hence its pathology being one brought about by other causes.

There can be no doubt, however, both from the study of analogous characters and from pathological discoveries about to be described, that the morbid anatomy of pyorrhea alveolaris is a pure and simple atrophy and degeneration, whereas the structures implicated by the process consist chiefly of the periodontal membrane and the (bony) alveolar process.

It might be well in this connection to define the pathological meaning and use or to consider the technical verbal distinction of the terms atrophy and degeneration. For some confusion may exist respecting the employment of the term degeneration, since it is found in biology and allied studies to describe the morphological ill-state known as degeneracy, and being recognized as an abnormal anatomical formation or maldevelopment of a part or whole organism, while the etiology in many cases may be traced to a corresponding abnormal circumstance or taint in an ancestor.

Degeneration in a pathological sense refers to an entirely different matter. It there appertains to a condition or change that takes place in the protoplasm of a cell owing to some interference with the normal process of metabolism; that is to say, there is a retarded action in the function of the protoplasm of the cell, thus abridging the exercise of complete transformation from a highly vital state to a complete metamorphosis. The process invariably ensues from the interference with the supply of nutritive material to a part. Degeneration, therefore, may follow from impairment of the quality or diminution in the proportional constituents of the blood or lymph, either from diseases, particularly those of a constitutional kind, or from the introduction into these ailments of poisons from within or from without the body. The introduction as by administration of phosphorus and mercury is an example of the former case, and the absorption of effete matter from the intestinal tract is an example of the latter.

Atrophy, in a similar sense, is a diminution in the size of a cell or a group of cells, and it may be regarded in one sense as being an initial step in the process of degeneration, thus partaking of the etiology assigned for that change. But it should be kept in mind that atrophy is not degeneration. Green makes the following distinctions between the terms. He says: "Excess of waste over assimilation leads simply to *atrophy* or simple diminution in the size of a part or of the whole body. On the other hand, alteration in the chemistry of a cell or in the quality of the food supplied to it may lead to *degeneration* of the cell-contents, some abnormal substance appearing in the tissue."

Degeneration is arranged for convenience of treatment into three groups: (1) Cloudy swelling and fatty changes, including fatty infiltration (accumulation) and fatty degeneration; (2) mucoid, colloid, hyaline, and amyloid denegeration; and (3) calcareous infiltration and pigmentary changes (Green's Pathology, p. 43). We shall not consider all these here. We have presented the arrangement merely for the purpose of calling back to your memory the outline and body of the subject, thus to come in greater sympathy with the text. Only three or four will receive any special notice.

In Green's Pathology, under the paragraph, Etiology of Fatty Degeneration, page 49, is presented the following; and owing to

the fact that the influences described under the heading are also found largely to contribute toward other types of degeneration, we have taken license to quote that part of the section verbatim, and hope that it may serve to further a complete exposition of this phase of our subject: "Fat (or fatty degeneration) being a possible intermediate product in the metabolism of a cell, its presence in an unusual situation indicates some incompleteness of, or disturbance in, the metabolism. The alteration in metabolism is due either (1) to the insufficiency of the supply of nutriment to meet the demand of a cell, or (2) to the inability of a cell to utilize the food placed at its disposal."

In the case of amyloid change it has been found to occur from the presence of toxins in the blood; for example, from syphilitic infection, and the change usually takes place in the coats of the arteries. Allusion will again be made to this change when speaking of the above-mentioned affection in a subsequent paragraph.

Calcareous infiltration or degeneration may be regarded as a salutary process, and, like all other degenerations, it marks the site of cell destruction caused by disease. The best examples of this form of degeneration are offered in gout and in pyorrhea alveolaris—in the latter affection it being found as a deposit on the roots of the teeth and in the peridental membrane. We shall have occasion to refer to calcareous change again in a later place.

We have observed that fatty degeneration, etc., is conditioned from a means by an interference with the supply of nutriment to a part. What causes an interference with the supply of nutriment to a part?

The question can be answered by saying: Any disorder that impairs the quality of the blood or lessens the quantity to a part. If it were desired, I should enumerate a hundred or more such diseases. In order to furnish perhaps a more satisfactory solution of the question or a better explanation of the topic, we shall indulge in a brief discussion of malaria, anemia and syphilis.

As you know, malaria is a complaint of the human blood and characterized by an intermittent type of fever, the causation of which is apparent in a microorganism—hematozoon malaria—which chiefly inhabits the red blood-corpuscles and rapidly destroys them. The bacteria disintegrate the red blood-corpuscles (thus liberating the hemoglobin), while the blood itself contains the toxin in solu-

tion. Thus is developed a case of secondary anemia—an ideal factor of atrophy and degeneration. The pyrexia and toxemia play also an important rôle, but we shall postpone the discussion of that phase for the present.

What is anemia, and how may it effect retrogressive change?

Pathologically, anemia may be considered as the diminution of the normal count of the red blood-corpuscles or the diminution in the proportion of the hemoglobin of the blood, or both, sometimes accompanied by leucocytosis. From this it may be seen that the whole constitution of the body stands much below par, and is therefore liable to infection and disorder which may chance its way. There follows consequently in anemia and in many other afflictions of this class a very much diminished oxidation power of the blood resulting from the poor quality or poor replenishing quality, thus favoring atrophy and degeneration. It may be asked how do these influences operate to produce such cellular alterations? We shall find the answer in Voit's observation in the following language: "That the presence of fat in the cells may thus be due to increased formation of the proteid matters, or to diminished oxidation of the products of its decomposition." The latter clause furnishes the rule.

If you have followed me closely you will now have seen that I have almost made a complete cycle, showing step by step through a series of consecutive complications the manner by which a disease may be made to react with destructive effect upon some part of the corporeal frame.

The following are two practical cases exemplifying the result of systemic ailments in producing pyorrhea alveolaris:

Some years since Dr. M. W., age about twenty-four years, a classmate of the writer, feeling very much indisposed toward his professional work, consulted Dr. H. for treatment. The leading symptom was a sense of malaise with slight fever, while his mouth was drenched with pus, accompanied with recession of the gums from the neck of the teeth and tolerable looseness of all the teeth. The doctor said that he thought that a teaspoonful of pus formed daily around the peridental membrane. The entire buccal cavity presented the appearance of typical pyorrhea alveolaris—recession of the gums and looseness of all the teeth. Dr. H. prescribed, but no improvement followed. On the third day following a blood-

test was made, revealing the error in diagnosis, and showed the presence of *plasmodium malaria*. The doctor was then given quinin and arsenic, with the result that in a few days' time a decided improvement was noticed in his physical condition; the pyorrhea also had begun to lessen. About three weeks from the time of instituting the rational treatment he was feeling quite as a new being, and the pyorrhea alveolaris had almost subsided. At this stage the gums presented merely a line of inflammation along their free border; the patient was again able to masticate, the gums having assumed a normal hue and the teeth had all grown firm. Mark you! that during the whole of this attack not a dental instrument had entered his mouth. No calcareous deposits were removed, because there were none present. This was a genuine case of pyorrhea and induced by malaria. To-day (above five years later) his teeth are all very firm in their sockets.

Second case. Mrs. H., age about thirty-five years, mother of two children, during her second confinement, which was not exceptionally complicated, evinced a severe attack of pyorrhea. There were present the looseness of the teeth, swollen gums, offensive odor, and the pus welling out from around the margin of the gums. The oral cavity had not been habitually kept in a hygienic state.

The condition of her mouth was called to my attention from the fact that she suffered pain, and was not able to employ her teeth very well at mastication. Immediately following the parturient period, which had not been unusually prolonged, the pyorrhea disappeared, no special measures having been applied. And, as in the former case, the structure of the mouth quickly regained a healthful state without the slightest use of dental instrumentation.

The oral trouble was undoubtedly brought on through the absorption of septic matter, and from infection, most likely producing toxemia, pyrexia, and maybe anemia.

The manner in which the inability of the cell to utilize the food placed at its disposal may be responsible for degeneration will be treated lightly, though perhaps sufficiently, under syphilis, in the following paragraphs:

Syphilis may be briefly defined for our purpose as a "general chronic infective (contagious) disease," accompanied by constitutional derangements, inoculable, and characterized by inflammatory lesions in specific tissues.

In the beginning it must be observed that there always exists in syphilis a toxic and anemic state of the blood. In this affection, where not properly treated, there will invariably develop amyloid change. The commonest site for it to appear is in the coats of the arterioles and blood capillaries, serving to narrow the caliber of the vessels, and consequently interfering with the supply of blood to a part. This process undoubtedly takes place in the vessels of the alveolar process, as a not uncommon means or factor in causing pyorrhea.

Syphilis considered in another aspect provides an expedient agency of retrogressive metamorphosis. The toxin of syphilis as well the toxins of ordinary pathogenic bacteria, not excepting also the organic poisons generally, vastly deteriorate the constitution of the blood and other humors of the body, and in this manner affect the life principle of the cell itself.

In order to corroborate the truth of that statement, reference will once more be made to Green's Pathology. The author speaks in the following manner: "The failure of the cell to make use of the material placed at its disposal is probably the more important cause (of degeneration). (1) This may be the result of the action of bacterial toxins, such as that of diphtheria, which causes fatty degeneration of voluntary muscular fibres, etc. (2) It may also depend upon the influence of inorganic (?) poisons, such as phosphorus, arsenic, alcohol, and carbon monoxide. (3) In many cases the failure of the cell must be regarded as a senile change" We feel that there is scarcely any need to illustrate this phase of the subject by any curt examples. For if there still exists any misapprehension as regarding what materials or influences conduce to excite these changes, we can do nothing better than to refer the person thus confused to some modern work on pathology in order to refresh his memory. However, it might here be added in conclusion that abnormal elevation of temperature plays also a very prominent rôle sometimes in the etiology of these changes.

Do atrophy and degeneration take place in the structure of the alveolar process in pyorrhea alveolaris?

Talbot in his manual on "Interstitial Gingivitis; or, So-called Pyorrhea Alveolaris," in chapter on Calcic Deposits, page 168, writes: "There are many instances in which interstitial gingivitis takes place with absorption of the alveolar process, and exfoliation

of the teeth without calcic deposits. . . . In absorption of the alveolar process inflammation does not seem to extend to the capillaries, the result of which is that this waste material is carried off by the circulation. In this way calcic material does not collect in the fluids and on the teeth." It will be observed that the doctor admits by the statement that pyorrhea may exist without inflammation. In the same chapter the writer quotes some author as saying: "Calcification begins, as a rule, in the interstitial tissue," and concludes by quoting Rokitansky as supposing that "they (calcic deposits) were formed by a metamorphosis of the tissue involved." We shall find that Rokitansky supposition on the metamorphosis corroborated by Dr. Woods Hutchinson, whose views we shall add in their proper order.

Further down the author proceeds: "A mere loss of function predisposes to calcification. Such is the case in and about the tissue of the alveolar process. The calcified material from the alveolar process collects in the soft tissues as well as upon the roots" (of the teeth).

Under the caption of Transitory Structure under Calcospherites, Talbot has this to say: "Small hard bodies are frequently found in the peridental membrane. These are sometimes in the form of concentric rings of *lime salts*, and are called calcospherites."

Hopewell-Smith, in his investigations of the morbid anatomy of pyorrhea alveolaris, has discovered calcic degeneration in the peridental membrane, and expressed the belief, if I have not misunderstood him, that the cause of same originated probably from a constitutional disease.

We shall now pause for a moment to inquire into the significance of these so-called calcic deposits. It has already been noted that the calcic infiltration or deposits are merely a degenerative change, or at any rate an indication of such. Green's Pathology, by Martin, page 73, under Etiology of Calcareous Infiltration, reads as follows: "In inquiring why these salts should be permanently deposited in certain tissue, attention must be directed to the fact that in the immense majority of cases the tissues affected are dead and dying, and that calcification is a common senile change." You are now prepared to realize that calcareous deposits, when present in the tissue, are always incontrovertible evidences of a preceding death of the cells. We have this statement verified by Dr. Woods

Hutchinson in his paper entitled "The Uric Acid Delusion and the Prevention of Gout," which appeared in the December 3, 1904, *Journal of the American Medical Association*, and which is said to contain the following: "Gouty blood contains no excess of uric acid; the toxins (of the blood and humors) attack the tissues about the joints as regions of least resistance, etc., the tissues die *in situ*, and, with the assistance of the leucocytes, break down into masses of sodium biurate and phosphoric acid, . . . or if enough lime be present the exostoses of chronic gout are formed. Throughout the animal world the presence of purins favor the deposits of lime salts, and with the production of urates is one of the incidents in slow non-suppurative tissue necrosis." Hence, with the force of this authority we cannot fail to be carried to the full conviction, namely, that all calcareous deposits formed in tissues are consequent effects of death and degeneration. From Dr. Wood Hutchinson's paper we have further learned that intoxication may be responsible for gouty deposits in the joint, whereas we have long contended that similar deposits found in pyorrhea are the expressions of many forms of intoxication.

Under the discussion of the pathology of pyorrhea alveolaris, Hopewell-Smith mentions Nikiforoff as recognizing two kinds of atrophy of bone as taking place in the alveolar process in pyorrhea. It is described as follows: "(1) Simple atrophy in which the socket disappears completely, and the roots are denuded; there is no inflammation, and the gums are attached but slightly to the periosteum of the socket; (2) osteoporosis when the bone is thinned at the expense of the Haversian canals which become widened (osteoporosis); the gums come up to the neck of the teeth, and there is no denudation of the roots. But the teeth begin to loosen on account of the osteoporosis; there is no pus, and the gums are normal." In conclusion, the author says: "If inflammation takes place in either of the above then alveolar pyorrhea ensues." The correctness of Nikiforoff's observation that the condition is a true atrophy is found substantiated in Green's Pathology, page 43. The first sentence of the paragraph runs as follows: "As in other tissue, atrophy of the bone is usually accompanied by more or less fatty degeneration, etc."

The preceding are the most salient arguments in support of the claims that the morbid anatomy of pyorrhea alveolaris is a true

atrophy and degeneration of the peridental membrane and the (bony) alveolar process of the maxilla.

We wish now to speak briefly of the form of pyorrhea, which is unaccompanied by suppuration. This type we have chosen to designate non-suppurative pyorrhea (a term that seems contradictory, but it is not when we remember that the real pathology is an atrophy and that the pus is always the result of pyogenic infection—a secondary condition).

There has long existed a tendency quite general among dentists to regard every case where suppuration occurs at the neck of a tooth as pyorrhea alveolaris; this is a mere suppuration of the gums; while, on the other hand almost as large a mistake is made by not recognizing the complaint.

Non-suppurative pyorrhea is one of the strongest proofs that the uncomplicated pathological condition of pyorrhea is a degeneration. It indicates without the question of a doubt degeneration of the tissue of the alveolar process or molecular death—without inflammation and, moreover, without infection by pyogenic bacteria. An almost precise counter-type is found in dry gangrene, so far as general appearances are concerned. The peridental membrane dries up much the same as the soft tissue in senile change. I have found the membrane dry and shriveled up to a fine, tough, fibrous shred, a part, at least, of which remains attached for some time to a point high up on the process; the fangs of the teeth are almost always devoid of their membrane, also smooth and highly polished without, invariably, the least accumulation of tartar upon them. This form or type of pyorrhea usually occurs during an attack of diabetes mellitus and as a natural consequence of extreme old age. Diabetes mellitus has been said to be responsible for pyorrhea to ninety-nine per cent.

This monograph would scarcely be complete without some reference were made to exciting and predisposing causes of disease. For the guild, which contends that pyorrhea alveolaris is but the expression of some external local excitant of the peridental membrane or gums, do acknowledge that some systemic maladies possess remarkable influence on the plague. "These disorders," says Patterson, "are predisposing only." Let us see whether or not this opinion is borne out by comparison of the standards of recognized ability. We shall frankly find that it is not, but that systemic

disorders are truly exciting causes of disease. Green's Pathology says: "Any agency which (merely) tends to cause departure from the physiological condition of a function must be regarded as a predisposing to disease—*e. g.*, privation and frequent irritation." Exciting causes: "These," says the author, "may be arranged under the heading of abnormal blood-supply and abnormal external conditions; it is also necessary to include altered nerve influence." . . . From this language it is plain to be seen that any disease or anatomical situation that materially impairs the nutrient quality of the blood may be a chief or exciting factor of disease. Hence, any disease which impairs the quality of the blood by dissipating its constituent elements, for instance, Bright's disease, malaria, syphilis, etc., or poison the volume—autointoxication—may be regarded as an exciting cause of disease, and may be responsible for pyorrhea.

The internal or systemic administration of remedies in pyorrhea has been plainly enough indicated in different parts of the context to need merely but suggestive recapitulation.

It goes without saying that a correct diagnosis has always to be made in every case, and measures instituted with the view of eradicating the cause. In the event that the diagnosis is impossible to be made owing to obscure physical conditions, treatment must be applied with the aim of improving the local atrophic modification. Any dyscrasia must be rectified, and good food with plenty of fresh air and exercise recommended. The sluggish activity of bowels and liver must also receive proper attention.

The local treatment consists in the scrupulous deterge of whatever obstacle may constitute any local source of irritation. Tartar concretions on the roots should be removed by means of properly adapted scalers; a certain degree of patience and skill is always required. Special disinfective lotions have accomplished but little. Miller of Berlin is now persuaded that pyorrhea alveolaris is not of bacterial origin, contrary to his recorded belief in the year 1890.

The complication and sequela: these being first of a local effect upon the stomach and intestines, owing to the contact of pus and microorganisms with the mucosa, producing inflammatory reaction, and, second, amyloid degeneration that takes place as the result of the absorption of toxins of the pyogenic cocci, thus favoring the process as described by Lubarch and others.—*Dental Brief*.

SOME PATHOLOGICAL CHANGES IN ALVEOLAR ABSCESSES AND THEIR TREATMENTS. By Geo. W. Cook, B.S., D.D.S., Chicago. Since the investigations of Virchow and Max Schultz all biological phenomena, both in health and disease, are becoming more and more understood as the result of investigations of the morphological as well as the physiological activities of cellular life. Therefore the treatment of alveolar abscesses, as well as that of any other disease process, can only be accomplished when the true fundamental knowledge of cell-activity is thoroughly studied. The onset of a disease process, like that of an alveolar abscess, involves tissue changes in three different kinds of cellular organizations. With the phenomena that make their appearance in certain forms of tissue changes like that of inflammation, there appears an increased transudation of fluid from the hyperemic blood-vessels, causing the lymphatic space of the tissue to become immediately filled with fluid; there is then at once established an edematous condition in the tissue in which leucocytes transmigrate through the vessel walls, and they can be found manifesting their ameboid movement in the interspaces of the cells of the tissue.

In many of the infectious processes the leucocytes attack and destroy the bacteria which are found in the lymphatic spaces, especially if these bacteria are of the coccus form. If this condition goes on for any length of time in alveolar abscesses, and especially those that are produced by the mild virulent forms of bacteria, there is a mild form of inflammation and the disorganization of the cellular tissues surrounding the apical end of the roots of teeth is very slow, and it may be weeks and even months before a true typical and well-defined alveolar abscess is established. From the time that the bacterial irritant has entered the field of liability of inflammation to the time that the tooth manifests all the signs and symptoms previous to the formation of an abscess, it may be possible for other conditions to appear in the nervous reflex of the parts adjacent to the tooth.

I cannot better illustrate this point than to relate a case which was one of an upper cuspid tooth where the root-canal had been filled for a great many years. Something like a year and a half or two years before the abscess had fully established its identity at the end of the root, the patient suffered pain in a number of

teeth in the upper jaw, some quite remote from the affected part. The tissue around the affected tooth was quite free from any painful condition, or even a slight soreness in the part at the end of the root, and almost before any symptoms appeared in this particular locality a fistulous opening had been established. The bacterial findings in the pus discharged were those of a staphylococcus and the bacillus of pulp gangrene. A microscopic examination of the tissue showed transmigrated leucocytes, some of which contained dead bacteria that were evidently destroyed through phagocytic action.

It frequently happens that these leucocytes pick up the bacteria that are in the lymph space and carry them to the lymph nodes, where the bacteria, provided their virulency is not too great, are destroyed and their effects completely lost. If such a condition goes on for any considerable time, the connective tissue in the vicinity of the root of the tooth becomes very much impaired and is found to contain large quantities of leucocytes, which are found to be somewhat in accordance with the degrees of inflammation in that particular tissue. The karyokinetic figures are very much increased, which Virchow considered to be due to a hypernutrition. But, as a matter of fact, the cells are not overnourished and the condition is the result of stimulation, which is probably due to certain chemical elements from the bacterial cells, or the liberation of certain chemical compounds from the tissue-cells; these are designated as inflammatory exudates and vary in accordance with the severity of the inflammation, which is always variable in accordance with the reactivity of the tissues involved and the virulency of the bacteria present. The fibrin exudate found in such fluid is, as a rule, an indication of more or less acute activity of the tissue, which brings about a more or less fibrous coagulation and is an indication of active degeneration of certain cells. It might be said in this connection that certain fibrin ferment has been separated from bacterial cultures. Of course, it is a difficult matter to say positively at this time whether this fibrous exudate is from the bacterial cells or not. Most likely, though, it is the result of certain ferments from the tissue-cells.

In the degeneration of tissue-cells like that of an alveolar abscess, a microscopic examination showing the presence of erythrocytes is an indication that considerable destruction of the

tissue has been going on, and that the blood-vessels are somewhat involved in the destructive changes. It might be well to say in this connection that such destructive changes involve more or less of the peridental membrane, instead of causing a destruction in the bony tissue. In the majority of these cases the destructive process will go on along the side of the root and make its appearance externally at the neck of the tooth. Such a condition would indicate that there were present round-cell infiltration and cellular exudation, with possibly the presence of pus. The cells may be few or many in number, but there may be so few that they can only be found by a careful microscopic examination. On the other hand, they may be numerous, with a general liquefactive process and necrosis of the tissue, with the formation of a large abscess cavity containing considerable pus. In such a case the polymorphous leucocytes are usually present in great numbers, which, as a rule, is a favorable indication in the destructive changes of the tissue.

It sometimes happens that degenerative changes of the tissues surrounding the roots of teeth take place in the manner above described, following the peridental membrane from the foci of irritation to the free margin of the gum. This destructive change that is going on may bring about certain toxic conditions of the cells of the periosteum, there producing a general periostitis of the tissue in that vicinity. If the destructive inflammatory changes take place in the bony structure, the outwandering leucocytes invade the Haversian system and the lacunæ. If the pus formed in such tissue is of an acid character, it will cause rapid destruction of the lime salts of the bone, and in a brief period there will be established a large abscess cavity which will involve considerable area of bone; still further, unless the leucocytes are not energetic in their bacterial destruction, the bacteria will work deeper and deeper into the Haversian canals and lacunæ. The lymphatic system may become so extensively involved in carrying away living bacteria that other and sometimes very remote parts of the body may be the seat of a destructive suppurative process.

It has been my privilege to see a number of such abscesses result in very serious conditions. If the infectious material establishes a periostitis, the area involved in inflammation and supuration usually becomes circumscribed, and, as a rule, does not

produce the extensive destructive changes as is the case where the bony structure is immediately involved independent of the periosteum. This can be accounted for perhaps by reason of the fact that the periosteum is rich in blood-supply and the leucocytes have a better opportunity to control the bacterial invasion.

Destructive processes may be said to exist in about three forms: acute, subacute and chronic alveolar abscesses, which are very much in accordance with the classification of inflammation, such as is involved in other tissue. The acute stage of an alveolar abscess might be said to be one which is rapid in its onset and brief in duration, and is usually the result of the successful invasion of the tissue beyond the apical end of the root with various forms of bacteria. There may be a number of organisms which are extremely variable in both the quantity and the kind present. I have yet the first alveolar abscess to examine for the bacterial findings, in which I did not find present the bacillus of pulp gangrene. As I have elsewhere stated, this bacterium is not, in the strictest sense of the word, a pathogenic germ, but that it is under certain circumstances capable of producing destructive processes in the tissue. So far as my observation goes, this bacterium does not produce an acute inflammation, but ordinarily brings about a slow degenerative process of the tissue, and if some other bacterium is present, like the streptococcus or staphylococcus form, it then seems to take, or, as I should more properly say, continues its principal rôle, which is that of liquefying dead organic material.

The staphylococcus that is usually found in the oral cavity is not ordinarily a very virulent organism. It may be said of the saliva from the individual in whom the physiological functions of the body are normal, that in the majority of instances the bacteria lose a certain amount of their virulency when they are permitted to live in this fluid for any considerable length of time. If these bacteria, after living in what might be termed a normal saliva, are introduced into the apical space where there has been no destructive change, other than that of a traumatic nature, it will very seldom happen that acute inflammation will be established of sufficient importance to produce any very serious symptoms. As a matter of fact, the severe abscesses that follow destructive degeneration of the pulp are the result of the tissue around the roots of teeth being involved in the absorption of certain toxic

material that has been formed as the result of degeneration of the pulp-tissue. Not only may it sometimes happen that the destruction of the pulp by bacteria produces local toxemia of the tissue-cells in the vicinity of the tooth involved in the process, but many of these toxic materials may have an elective affinity for certain tissue-cells and produce certain general conditions which may never be recognized as the result of this destructive process. But, suffice it to say, the bacteria that make their way to the apical end of the roots of teeth through the degeneration of the pulp are more destructive in their tendencies and the tissue has less resistance. Consequently, an acute abscess is the result of the entrance of pathogenic germs into the tissue, the resisting power of which has almost been reduced to its minimum.

I have isolated from one to nine different kinds of bacteria from a single abscess. In several instances I isolated four kinds, with which it was impossible to produce in an animal a single process which indicated that of the formation of pus. Such a condition could only be accounted for by growing these organisms in the same culture media, and making inoculations from the culture in which the four forms had grown together, in which case the condition proved that these organisms must be together in order that the active inflammatory and pus-producing powers could be accomplished. I hope that I shall be able at some future time to go into more detail with this peculiar biological phenomena, for they have an important bearing on the pathology and treatment of various diseased conditions, especially like those of alveolar abscesses in which we have the introduction of a number of bacteria of different species.

Out of the many varieties of bacteria in the oral cavity, it is a question if not all of them, under certain circumstances, are not capable of producing inflammation, while on the other hand, if these same bacteria were permitted to live constantly in the saliva of a perfectly normal individual, it is a question if any one of them would produce the formation of pus. But if these bacteria were to remain in the tissue for any great length of time they would become mild irritating agents, and produce certain degenerative changes in the tissue, which would not be recognized by the unaided eye as diseased conditions for perhaps months and even years.

The more closely we study the biological activities of bacteria as found in the mouths of healthy individuals and those taking part in local pathological changes in the tissue, the more nearly will it be possible to retain the roots of teeth in a healthy and useful condition. When an abscess has been established at the apical end of the root of a tooth, the question naturally arises, in what manner and to what extent can that tooth be retained as a healthy and useful member? It has been my privilege to study the bacteriological and pathological conditions of a large number of teeth, in which the treatment and root-fillings had been done anywhere from several months to a number of years previous to coming under my observation. On the removal of the root-canal filling in a number of teeth, which many times consisted of various forms of guttapercha, the oil of eucalyptus could be detected.

For a number of years, in the general practice of treating root-canals in which abscesses had been formed, the chemical agents used were various preparations containing principally the volatile oil series, which, as is well known, have no special power of disinfecting and really have but little value as antiseptics. They are extremely irritating to the tissue-cells, and many times sufficiently stimulating to the bacterial forms of life as to produce cell-proliferation in these organisms, thus producing the increased number of bacteria instead of diminishing them.

The oil of eucalyptus has very different antiseptic effects on such bacteria as are permitted to grow in the intestinal tract for some time to bacteria that have been permitted to live in alveolar abscesses and putrescent root-canals the same length of time. In the latter case the organisms are but little affected by this agent, while in the case of the colon and typhoid bacillus the above named agent is quite effectual, especially in fresh cultures directly from the intestinal tract.

What is true of the oil of eucalyptus is very largely true of all the essential oils. The aromatic series contain almost universally the terpene group, which are hydrocarbons, possessing the general formula (C_5H_8). There are some twelve of these terpenes, varying somewhat in their chemical structure and their stereometrical forms. The sesquiterpenes ($C_{15}H_{24}$) form another group of the hydrocarbons. There are some that are of a still higher molecular combination than those just mentioned: the diterpenes ($C_{20}H_{32}$).

Any one of this group is antiseptic only so far as it is capable of being disassociated or going into solution. Consequently, these agents are little to be relied upon as antiseptics, for they do not go into solution very readily. It is therefore necessary to adopt some more efficient compounds for the treatment of alveolar abscesses.—*Western Dental Journal*.

THE USE OF THE BLUE LIGHT IN THE REDUCTION OF SWELLING AND THE ALLEVIATION OF PAIN. By J. C. Watkins, A.B., LL.B., D.D.S., Winston Salem, N. C. About a year ago my attention was called to a clipping from a newspaper, the substance of which was that a surgeon in Paris claimed that by the aid of certain rays of light he had been enabled to produce anesthesia to such an extent that he could perform minor operations without the patient experiencing any pain. I must confess that I did not have a great deal of confidence in what I read, nevertheless I decided to give these rays a trial, and began a series of experiments, the results of which, much to my surprise, have been very satisfactory, inasmuch as they were most successful.

It is the "Blue Light" that I wish to bring to your attention—not for the extraction of teeth, as has been mentioned in some of our journals for the last few months, but for "the reduction of swelling and the alleviation of pain." Those who have used the blue light have done so by subjecting the patient to a bath of blue light in a dark room, and these rays, they claim, exert an influence upon the brain through the optic nerve, while perhaps the element hypnosis enters slightly. The system that I wish to introduce is so simple that we all can at once incorporate it in our practice. It is simply to apply the blue rays directly to the part affected.

I will describe the appliance that I have constructed. It is simply a sixteen-candle-power blue electric-light globe arranged in a funnel-shaped tin shield which at its mouth is about four inches in diameter. This is extended about four inches, and has at its end a ground blue glass and convex lens. The ground blue glass is used to disseminate the blue rays so that the patient may not know the simplicity of the apparatus, and I attribute no especial virtue to the lens. I have kept a clinical history of a number of cases, and will simply indicate several different classes where I have used the light to advantage.

Class I. In "abscessing teeth," where the tooth is "long" and the patient cannot endure touching the tooth, I have made a simple opening, and then with the blue light had the tooth perfectly easy in a few minutes. But in a number of recent cases where I could not have opened the tooth, because it was so very sore, I have with the "blue light" eased the pain and thus been enabled to open into the pulp-chamber without hurting the patient.

Class II. After inserting Richmond, Logan, or shell crowns, where the patient is experiencing excruciating pain, the "blue light" will in a few minutes have the pain entirely subdued.

Class III. In the severe throbbing pain following the extraction of an "abscessing tooth," the blue light will bring relief in five minutes.

Class IV. Last week a man came to my office suffering greatly, saying that he had been unable to sleep during the previous night and was very anxious to get relief. I found that the right superior second bicuspid was causing the trouble. There was a snugly-fitting shell crown, extending over a line under the gum, on the tooth. The gums were inflamed, and there was great soreness of the parts adjoining the tooth, which was loose. Upon inquiry I found that the root, which had been badly diseased, had been built up with amalgam around a screw-post. This had been completed over fifteen months, during which time the tooth had been perfectly comfortable. With the patient thus suffering, I applied my blue light, and in a few minutes pain had subsided, but the patient experienced a feeling of fear lest the pain should recur. I sent him back to his own dentist, and on the following morning he telephoned me that his tooth had given him no trouble, was much tighter, and there was only a little soreness.

A little girl came to me with the roots of the left upper first molar "abscessing." The roots were nearly covered with overlapping gum, and her face was very much swollen, so much so that you could hardly see her left eye, as she could not open it. There was also throbbing pain. The light was applied, and in about twenty minutes the swelling was greatly reduced; she could open the left eye about as wide as the right, and the pain had subsided. I then extracted the roots, which did not seem to cause much discomfort.

Class V. I will mention only one more class of cases, and that is impacted third molars; and here the "light" has proved my

best friend. The most remarkable case I have had was that of a man twenty-eight years of age, whose left lower third molar was his "thorn in the flesh." The anterior cusps showed, and the others were covered. I cauterized the overlapping gum one afternoon with carbolic acid; similar treatment was given the next morning. He continued to get worse until eleven o'clock, when he had to leave his business and go home. At four o'clock his face, tonsils, and throat were swollen, he could scarcely open his mouth wide enough for one to insert the fingers between his teeth, and the pain was intense. The light was used about twenty minutes, and gave relief. He could open his mouth with comfort, the swelling was so nearly gone that one could not notice it, and he felt very little soreness in his throat and mouth—not enough to mention. The next morning there was a slight soreness, while on the following day he was entirely well.

I realize that many members of our profession will think I am very enthusiastic over my "blue light," but I ask you to give it a fair trial, and I am sure that in many cases—cases where you scarcely know what to do—you will give ease and comfort to your patient, and experience great satisfaction yourself.—*Cosmos*.

A PRACTICAL WAY TO IMPROVE DENTAL COLLEGE INSTRUCTION. By Dr. William H. Trueman, Philadelphia. "At the Princeton Commencement President Wilson announced the new departure in instruction which he has been planning for some time past to introduce. A committee of the alumni has assured the University of additional income exceeding one hundred thousand dollars a year. This money is to be spent in adding to the Princeton faculty fifty preceptors, who are to do, apparently, what tutors do in the older English universities—that is, they will keep in constant touch with the students, 'as guides, advisors and testers of their learning.' Less reliance than formerly is to be placed at Princeton on recitations and examinations, and more on conferences of individuals and small groups of men with their instructors. Not only the new preceptors, but the older members of the faculty, are to take part in these conferences." (*Harper's Weekly*, July 1, 1905, page 931.)

This new departure is in line with the change that has been slowly going on in educational institutions. The instructor is being

brought closer to the pupil. "Telling how" is giving way to the much more practical "showing how;" the gulf between the desk and the benches is slowly being bridged, and the printed text-book will soon be supplanted by well-trained, properly qualified demonstrators, who will interpret to individual students the instruction formerly imparted from the lecture-table. This will call for a large increase in the teaching staff, a higher intelligence and a marked aptness for teaching that will demand and merit a more liberal recompense. It will also make needful more room and more appliances. All these things are costly, and the fees received from students do not in the higher educational institutions provide the facilities required.

While this fact has made an impress upon the community that has borne fruit, it does not seem to be appreciated by members of the dental profession. Judging from remarks now and again recorded as having been made at dental gatherings, the impression prevails that dental colleges are mines of wealth, and a dental professorship is a short cut to fortune. This is far, very far from being the case. While the cost of instructing has very much increased, the college fees have not been materially advanced, so that, notwithstanding the larger classes, that portion of the income charged to profit, from which the teaching staff is paid, is far below a just recompense for service rendered. The dental graduate seems impressed with the idea that his diploma is a *quid pro quo* for the fees he has paid; with its reception the transaction is ended; he has no further use for the college and its future welfare is no concern of his.

It is very fortunate that this feeling does not extend to other vocations, otherwise educational facilities would be very meager in this country. The medical fraternity contributes very largely to maintain the varied educational facilities of the medical profession. Its members give freely of their time, talent and earnings to found, maintain and improve their colleges, hospitals and libraries, and their example has prompted the laity to liberally assist. Their unselfishness is appreciated by the community, and in return the profession is freely accorded a social distinction and a place of honor as public benefactors.

The dental profession does not receive, and has done nothing to merit, any further consideration from the public than that ac-

corded other artisans. The dentist does his work and gets his fees as a *quid pro quo*. While it is generally recognized by the profession that dental college training could readily be made more effective, any suggestion of providing the means is coldly received. A far less sum than that provided by the alumni of Princeton would enable any one of the dental colleges to vastly improve its teaching facilities, would attract to its teaching staff men of talent and ability who under present conditions forsake the schools for private practice, and the mere fact that it had been done would raise the profession in public esteem. The excuse that the profession is poor is false. It is not dollars and cents, it is *esprit de corps* that is wanting. It is high time the dental profession fell in line and in a practical way contributed to improve its own educational facilities. Let the faculties be assured that they will be financially supported in advancing the educational standard, and they will as readily respond as have other educational institutions. Loudly proclaiming that we are not commercialists but professional men is idle talk so long as there is nothing publicly seen to show the existence of the dental profession but its business signs. We do nothing for the community but that which we are paid for, and for this we are constantly scheming for higher fees. The example of the Princeton alumni is an excellent one to follow, and the method of instruction liberally provided is just what is wanted to make the dental college course what it should be.—*International*.

SOME SO-CALLED DISEASES OF DENTITION. By R. P. McGee, M.D., D.D.S., Denver, Colo. Read before the Colorado State Dental Society, June, 1905. The prevalence of intestinal and nervous diseases among children between the ages of six months and three years has led to the general belief that dentition may be the immediate cause of many of these conditions, instead of being merely a coincidence.

It is, of course, possible and probable that delayed or disturbed dentition may induce serious derangements, but the simple fact of the prevalence of nervous and digestive disorders during the period of dentition gives no good ground for the consideration of dentition as an etiological factor in these cases.

The nervous system and digestive apparatus of a child of six

months are in an elementary state and are capable of the performance only of the simplest functions.

About one-half of the healthy children cut their teeth without visible symptoms, local or general; in the other half some slight disturbance is seen, usually lasting only from a day to a week. These symptoms are disturbed sleep, fretfulness, loss of appetite, usually an increased flow of saliva, a slight stomatitis and a constant desire to bite something. The bowels are usually constipated, but diarrhoea may be present. Symptoms more severe than these are uncommon in a healthy child, but frequently occur in delicate or rachitic children. Convulsions due to dentition in healthy children are very rare, but in the rachitic child are often present.

It must be remembered that at this time infants are in a condition peculiarly susceptible to almost any nervous or gastric disorder, and that the digestive tract may be excited to diarrhoea and inflammatory states by the slightest carelessness in regard to diet.

Importance of Proper Diet for Infants.—The very fact that the teeth are developing and coming into position indicates that the liquid diet that has heretofore been sufficient for the needs of the child will no longer support the added demands for nutrition that the rapid development now makes necessary.

Yet at this period the digestive tract can only take care of the simplest solids. We know that nature provides food for the development of the child up to the period of weaning, by causing the mother's milk to gradually change from a practically predigested fluid to one containing the highest percentage of nutriment in any one known substance. It would be an utter impossibility for a child of three weeks to digest the milk of a mother whose babe was three months of age.

Why is it then that the simple process of teething must be charged with causing so much suffering in the infant? There are as many teeth cut in the winter as in summer, yet most of the trouble comes in the warm months.

The child will be given food fit only for an adult by its indulgent parents. When the family sits down to a meal, baby will be fed green vegetables, cakes, pie and pastry. At first he makes a wry face and spits it out, but after repeated attempts he swallows it. Then this food passes through the stomach and the delicate little intestines, acting as an irritant, and soon we have colic, diarrhoea and

frequently dysentery, in case after case where there would have been no disturbance had a proper diet been pursued.

Disturbances Due to Dentition.—There are conditions, however, that are the result of dentition. These are usually nervous reflexes and stomatitis, produced by pressure upon the dental branches of the fifth nerve by the advancing tooth which has met with a resistance in the overlying tissue that checks or stops its upward movement. Here the delicate pulp which is building up a tooth form with its cementoblasts receives all the pressure of the eruption, and the result is a regurgitant pressure upon the fibers of the trifacial nerve, which, being intimately connected with each individual cranial nerve from the third to the twelfth, can and does produce tonic and clonic spasms, otalgia, neuralgia and a host of those painful conditions that result from reflex nervous impulses.

When dentition is to blame for these reflexes, the mouth of the infant is hot and dry. There is usually a stomatitis. The gums are red or purple, swollen and tender, the infant starts suddenly from sleep, cries as from severe pain, has a temperature of from one to three degrees above normal and shrinks from the fingers that would touch the gums.

Treatment.—In my opinion, it is here an absolute necessity to freely lance the gums over the advancing teeth. It is at times necessary to repeat this operation several times. The constitutional treatment should be such as, in your judgment, will tend to subdue the nervous reaction and promote an easy and regular bowel action.

Being a follower of Hahneman, my treatment in these cases usually consists of the tincture of aconite, tincture of belladonna, tr. ges or tr. of chamomilla from the 1X to 3X, according to the age of the patient and the severity of the symptoms. In using these tinctures, I put qt. V in one-half glass of water and give one teaspoonful each half hour.—*Items of Interest.*

AMBIDEXTERITY AND THE DENTAL OPERATOR.

By C. E. Doty, D.D.S., Pratt, Kan. The men who comprise the dental profession are divided into two classes—those who by experiment and original research bring forth theories and rules of practice, and those comprising the larger and none the less essential class, who by reason of certain chains of circumstances,

both past and present, must content themselves in carefully putting into practice the rules laid down by the first.

The man who carefully, conscientiously and discriminatingly incorporates into his practice the new and good that the originators give us in theory and practice is only one step behind, and while he may suffer as an individual by being the follower instead of the leader, his clients do not suffer in the same degree. To this latter and larger class I must acknowledge myself to belong, having never engaged in original research to the extent to be able to claim a place among the first.

Nature and circumstances place one man in positions where it is easier for him to do certain things that it would be for another. Having been favored by nature and early cultivation, I feel warranted in bringing to your notice some of the advantages of ambidexterity as a quality in the dental operator.

Before entering into a study of the application of ambidexterity to the work of the dental operator, a short study of the scientific reasons for right and left-handedness will not be out of place.

Dr. Archibald Church, Professor of Nervous and Mental Diseases in the Northwestern University Medical School, in his work on "Nervous Diseases," says:

"The acquired faculty of speech and the numerous motor and sensory memories associated with it are almost always mainly represented in the left cortex in right-handed individuals.

"The superior weight and development of the left half of the brain is probably largely attributable to its better nutritive supply through the arrangement of the vessels at the aortic arch and the larger caliber of the left carotid. This induces right-handedness, which in time, no doubt, retroactively increases the functional activity of the left cortex. At the same time, the left hemisphere becomes potentially greater, more acquisitive, and therefore largely the seat of acquired motor and sensory education, which in time increases its growth.

"It is probable that some overflow occurs in most brains, so that automatic emotional and expletive expressions either come to be located in the right brain, or their frequent repetition sufficiently educates the right cortex to enable them to be recalled through its agency when the left centers are cut off.

"Similarly, if speech control be lost to the left half-brain, the

right, especially in young persons, may in time be educated to take its place in large measure. It is worthy of consideration whether the whole conscious or unconscious tendency of education, habit, custom and practice to make all men right-handed is not a serious mistake. It seems plausible that should left-handedness, or rather ambidexterity, be assiduously cultivated in children, the two hemispheres of the brain might enjoy a greater equality, and the individual secure not only amplified muscular control, but a certain lessened liability to aphasia and hemiplegic losses."

From the foregoing we are led to conclude that were not habit, custom and practice so largely on the side of right-handedness, a larger number of people would be ambidextrous, at least in a measure. That right or left handedness is more a result of cultivation than natural propensity at least one argument would seem to prove: When the parent says to the physician, "My baby is going to be left-handed," the physician, if he is a thinking man, at once begins observations to determine if the child is not a victim of infantile paralysis on the right side. The manifestation of a right-handed tendency would have the same significance, only it would not be called to the notice of the parent, as would the left hand. Then, as ambidexterity is susceptible of cultivation, the earlier in life the effort to cultivate is begun, the greater degree of proficiency we would expect.

An example of ambidexterity in surgery was to be found in Dr. Joseph Pancoast, professor of surgery in the Jefferson Medical College, Philadelphia. It was said of him that he was as dextrous with one hand as with the other, and would never go from one side of his operating table to the other to accommodate the use of either hand. As examples of what can be done to educate the left hand, two men, both professors in the University of Pennsylvania (Robert E. Rodgers and Franciscus G. Smith), had each lost his right hand. Both of these men were not only legible, but beautiful writers with the left hand. For information regarding these three men I am indebted to E. A. Gaston, M.D., of Pratt, Kan., who was personally acquainted with them. Having seen that ambidexterity is susceptible of cultivation, the application is largely a matter to be worked out in accordance with each man's individuality. In my own work I have been

able to use it in many ways, and there are still other places where I have not been able to make the application. I have been unable to do good malleting with the left hand. In excavating, amalgam work, and pulp-canal treatment on upper bicuspids and molars I have found the use of either hand an advantage, operating on teeth on the left side of the mouth with the left hand, and vice versa. In the use of scalers many little movements may be executed with the left hand which would be difficult to accomplish with the right.

The realm of extracting, however, is where I have been able to derive the most satisfaction from being able to choose hands. The ten anterior teeth above may be extracted with either hand. The lower molars may be extracted from the left side of the mouth with the right hand, and from the right side with the left hand, using horn-beak forceps.

I have been able to do my best work with the elevator with my left hand; upper roots on the left side, and lower roots on the right side, I can often get to best advantage with my left hand. The occasion suggests the practice in most cases, and about the only scientific rule I can give for my practice in this particular is that, wherever the operator's head or hand may be changed from a position of excluding light, to an avoidance of same by changing hands, or standing on opposite side of patient, or both, there will be found the place for him to cultivate ambidexterity.—*Dental Brief*.

TREATMENT OF PUTRESCENT TEETH AND A PERMANENT ROOT-FILLING. By Dr. N. N. Wycoff, Trinidad, Colo. Read before the Colorado State Dental Association, June, 1905. In presenting this paper I do not wish to lay claim to any treatment or operation which is entirely new or original, but believe there may be some points brought forward with which some of you are unfamiliar and which I can explain and defend as feasible, commendable and successful in the practice of our profession.

In no other branch of dentistry are the conditions so varied or the treatment so diversified as in connection with pulpless teeth. While we may be entirely familiar with the physical and pathological characteristics of the tissues a correct prognosis is sometimes difficult.

In studying my subject I deem it necessary to consider pulpless teeth under two classes, viz.:

Class I. Those which have died through mechanical causes and thermal changes.

Class II. Those dying from infection through decay subjecting the canal contents to inflammation, suppuration and death. With both classes the most important factor is the use of every antiseptic precaution, as we will invariably have a septic condition present at the apex of the root, with a necrotic or pericemental trouble ensuing, if careless.

Treatment in Class I. Apply the rubber dam before an opening is secured into the canal, so that all danger from further infection by means of the numerous species of bacteria present in the oral secretions may be obviated. Wash out with peroxid of hydrogen and warm water, dry with alcohol, disturbing the inner contents of the canal as little as possible, until sterilized.

For anterior teeth I use oil of eucalyptus; posterior teeth, beechwood creosote, on a small wisp of cotton, sealed in the canal loosely with cement. After three or four days reopen with rubber dam applied, wash out with alcohol, and with a broach remove all the contents of the canals thoroughly, then dress with iodine and creosote or eucalyptus for four or five days, when root canal may be safely and permanently sealed.

Treatment in Class II. First, where there is a blind abscess, drain tooth with peroxid of hydrogen and warm water, open as thoroughly as possible, then apply the rubber dam, dry with alcohol, insert a loosely placed cotton dressing with Black's 1-2-3, not closing the foramen, seal with temporary stopping, perforate and paint the gums with equal parts of iodine and aconite, avoiding all unnecessary pressure during the treatment. After three or four days if inflammation has not subsided and pus is still present, repeat the treatment.

Should there be no pus nor inflammation present, treat as above described for Class I, when there is not the complication of a blind abscess.

If the abscess has a fistulous opening, wash it thoroughly with peroxid of hydrogen and warm water, forcing the same through the fistulous opening. Then fill the cavity with gutta percha, puncture the filling and insert the nozzle of a hypodermic syringe partly filled with creosote or eucalyptus, forcing the medicine through until it

appears at the opening in the gums; then dismiss the patient, leaving the cavity open, and repeat the operation in three or four days. After this treatment the same methods may be applied as above described where no complications previously existed.

Now, we are ready for a filling which should possess the properties of being germ-proof, antiseptic, non-irritant, and permanently seal the apical foramen. This last property (permanently sealing the apical foramen) I believe to be the key to success or failure.

The various root-fillings tolerated by the profession are usually not used, but abused, and in most cases canals are imperfectly sterilized and recurrent sepsis is brought about by disregard of this principle.

After experimenting with chloropercha, iodoform, zinc oxid, creosote and several other combinations of various materials for over a year and many times only partly filling a canal, no matter how determined I was in the accomplishment of the same, I became interested in several articles on tannic acid, iodine and cotton and decided to try the same, after convincing myself that the properties which a permanent root-filling should possess were embodied in the above.

First—Tannic acid is an astringent and styptic which tans into leather any organic tissue that may still remain in a canal and renders the same inert.

Second—Iodine is antiseptic and disinfectant.

Third—Cotton is the only germ-proof material known, as evidenced by the use made of it by bacteriologists.

Fourth—The iodine and tannic acid have a chemical action upon the cellulose in the cotton forming a new compound as well as throwing down metallic iodine. This can easily be proven by taking a pellet of cotton, dipping in iodine, then tannic acid, and after pressing out the surplus liquid allowing it to dry in the sun.

A thread of cotton is wrapped around a smooth broach, dipped into tincture of iodine, then into finely powdered tannic acid, then forced to the apical end of the root-canal, afterwards drying the canal so that all excess of iodine is removed (and there should be very little), wipe out canal with alcohol and then fill with whatever material suits the operation. I generally use medicated guttapercha and cover with cement.

Discoloration of tooth will result only from carelessness in method of operation. Sepsis will not recur, as you have a material which

becomes as hard as cement, sealing the apical foramen perfectly, non-irritant, antiseptic and germ-proof.—*Items of Interest.*

NEW MODE OF STERILIZING INSTRUMENTS. By A. W. Harlan, M. D., D. D. S., New York. It does not matter what your system of sterilizing instruments may be now, you are invited to use another and perhaps more efficient method. For some time I have been sterilizing instruments with water which has been sterilized in the following manner: Take a copper pan or kettle which is polished on the inside and fill it with water from the faucet. This must stay in the vessel for three and one-half hours, when it is ready to use. All germs by this time have been destroyed. If you like to boil the water you can do so, but it is not necessary. For each ounce of this water add one-half grain of dried sodium carbonate and place all your instruments in this. They should be scrubbed and cleaned in the sterilizing water and then rinsed in another vessel and dried with pieces of cotton cloth which have been heated to 400 degrees F. in a copper box. This is easy to do now, as electricity is so cheap and is always ready for use. The French people who rent bath tubs always place the towels in a small square box with a closely fitting lid so that the towel is hot and ready for use. The cover for the tub, which is composed of linen, is quite hot when it is spread over the tub. In this manner, without knowing it, they provide for you a sterilized tub and towels to use for rubbing yourself. The French and other continental cooks use copper kettles and saucepans for cooking, with a bright interior, as food always tastes better when so cooked. The small amount of colloidal copper dissolved in this manner acts as a complete sterilizer, and hence the good taste of the food. If you cannot get a suitable copper vessel, strips of polished copper may be suspended in the water to be sterilized, giving a larger surface for the water to act upon.

Did you ever think of the filth in the waste pipe of a fountain cuspidor? A gallon of sterilized water sterilized with copper will make it free of smell in two or three minutes. All of the grosser instruments, such as forceps, separators and pliers, can be sterilized in this way also. The rubber dam may be washed in this water without leaving odor or taste. If you desire to filter the water before sterilizing, do it through sand or fireclay and then put it into

the copper vessel. This water may be bottled and used to dilute medicines. The glass tubes used in a saliva pump should be sterilized with such water, to which is added one grain to the ounce of sodium carbonate. All of the drinking glasses, syringes, mirrors and everything going into the mouth may be sterilized quickly and certainly in this way. It is very difficult to completely sterilize your hands. This is what is considered the latest.

Disinfection of Hands. K. Vogel has been trying hot air to disinfect his hands—already disinfected. He found that disinfection with hot water-alcohol and then corrosive sublimate is superior to tincture of soap method, although the latter is superior in its technique. The advantages of putting the hands into a hot air box are obvious, as the hands sweat and bring out the germs from crevices and mouths of glands, so they can be destroyed even with the tincture of soap.

Some recent experiments of Kinneman, of Chicago, using an iodine solution composed of:

Iodin	gms. 2.5
Sodium Iodid	gms. 5.5
Aqua, sterilized	250 C.C.

This is 1 to 100 solution.

These experiments in detail are published in the Journal of the American Medical Association for August 26th and September 2d, and the conclusions are that for all pathogenic organisms 1 per cent of the above combination is superior to bichlorid of mercury, even in a more concentrated state. Even a solution of iodine of 0.2 per cent will and did destroy the staphylococcus pyogenes aureus and others in two minutes, while 1 to 1,000 bichlorid did not destroy the same organisms in less than thirty minutes. His conclusions are that it is easily prepared and is stable. It is non-toxic, being one-fourth as toxic as bichlorid. It does not coagulate albumen nor form inert compounds with tissues. It is quickly effective, the stain it produces soon disappearing. It has a remarkable penetrating power. It is really strong enough for mouth disinfection in 1 to 500 or even 1 to 1,000.

Mono-Chloro-Acetic Acid. In returning to the main thought of this paper I desire to call your attention to the use of mono-chloro-acetic acid as a disinfectant for the odors, gases and poisons found in the roots of a pulpless tooth. Its formula is $\text{CH}_2\text{Cl.CO}_2\text{H}$. It is

easily soluble in water, preferably in the copper sterilized water previously referred to in this paper. When a tooth is washed or irrigated with from 5 to 10 per cent solution of this acid it will soon be rendered sterile. You may seal it into the root or pulp chamber with perfect ease, as the gases of decomposition will be destroyed as rapidly as they are formed. It is colorless and will not stain. It is a disinfectant in the sense that it destroys infective material in the same manner that heat does; the mass is inert and will not re-poison if allowed to remain in the tooth for a few days. If you will permit me I will sum up in a few words my conclusions regarding disinfectants:

1st. The water used in the operating room for all purposes must be sterilized.

2d. It can be sterilized in polished copper vessels even without boiling.

3d. The cotton, silks, napkins and paper rolls should be sterilized in a copper box at 400 degrees F.

4th. All instruments are sterilized by washing and scrubbing them in the above sterilized water by adding one-half grain dried sodium carbonate to the ounce and drying them in a copper box, or using sterile towels, cloths, or napkins to accomplish this. They must be kept in a case lined with glass. The brushes should be cleaned and kept in glass bottles with wide mouths, stopped with cotton soaked in sterilized water and dried before using.

5th. The disinfectants used in or about the mouth or teeth must be chosen for their known properties of destroying chemically poisonous matter and pus-producing organisms, as well as the animal alkaloids.

6th. Mono-chloro-acetic acid will do this; iodine and sodium iodide will also do it, but it cannot be used for the anterior teeth.

7th. A poisonous dose of sulphate of copper could not be obtained from copper sterilized water, if a person should drink forty gallons of it per day, which is an impossibility.—*Items of Interest.*

PAIN AFTER TOOTH EXTRACTION. The extraction of an abscessed tooth is generally followed by great pain. I have found lysol to be the ideal remedy in such conditions, placing it undiluted in the socket. It will relieve the pain immediately, help to check the hemorrhage and establish antiseptic conditions in the socket.—C. B. WINTER, *Dental Era*.

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Editorial.

WHAT WILL THE PROGRAM BE?

Just now when programs are being arranged for the various State meetings throughout the country it seems to us an opportune time to say a word about the importance of having a larger number of scientific and literary papers and discussions at meetings and fewer clinical demonstrations. The latter are better adapted to the small local meetings, for the reason that clinics cannot be successfully demonstrated before a large body of men, for when attempted in our State meetings but a very small number of those present can be benefited.

On the other hand, in the majority of annual meetings of the different professions it is usually planned to bring the greatest good to the greatest number, which object is attained by bringing before such meetings the most advanced and thoroughly digested thought concerning the most important subjects of the time. Since this is effected by means of papers or lectures delivered by good speakers, large bodies of people are reached and educated. Every one attending such meetings has not only the privilege of listening, but also of taking part in important discussions of both scientific nature and value.

A careful examination of published proceedings of the various State dental meetings of recent years does not show much, if any, improvement in the literary work, but instead we find evidences of a falling off in the scientific value of the papers, and a waning of vital interest and thought in the discussions of such papers as are presented.

In the nature of things our papers and discussions should show growth from year to year as our standards ascend in the scale, for the teaching corps of the colleges is stronger and the men who are

coming into the profession, taken as a whole, are better educated than formerly.

We know that a strong claim is made favoring clinical demonstrations at the State meetings in that the clinics are supposed to draw the crowds and without them we could not secure a respectable attendance of the profession. As regards the literary program, however, the power of its attraction has been proven by other professions, and we therefore fail to understand why the same should not hold good in that of the dental profession also. We believe that such would not only increase the attendance, but also create a desire in the individual practitioner tending to more study and scientific work in his leisure hours at home.

If the program committees will weigh this important matter of securing essayists who will give by means of their best thought an impetus to the scientific and literary side of the profession we confidently predict a swing of the pendulum toward favorable comparison of dentistry with other professions from an intellectual and scientific standpoint.

Much of the success of the meeting depends upon the work of the executive committee, and especially upon that of the program committee. Frequently these duties are but poorly carried out, either from negligence or lack of proper comprehension of what the work involves, and we have, therefore, thrown out these few suggestions with the hope that it may be of some benefit in organizing successful meetings throughout the United States, and reviving interest and enthusiasm in the literary side of our profession.

THE INTERNATIONAL DENTAL JOURNAL.

We regret to see the official announcement in the December issue of the suspension of publication of the *International Dental Journal*. We were one of the original subscribers of the stock of this journal and have always appreciated its high standing and the splendid service which it has done for the dental profession, it having stood at all times for the best that could be procured in dental literature. This journal was always ably edited and we shall greatly miss its monthly appearance on our table, it being one of the exchanges that we prized the highest.

We have never been quite able to understand why this journal

could not have been made a success. Of course, the subscriptions alone, especially at the rate now obtaining, will not support any journal, and therefore, practically all must depend upon the advertisements for financial support, and the requisite help in this direction is almost wholly dependent upon the subscription list being large enough to make the journal profitable as an advertising medium, and it would seem as though it were here that the *International* fell short of attaining success.

Conducting a journal is first of all a business proposition in that subscribers and advertisers must be secured to cover the expenses. This holds good in all forms of journalism, professional and otherwise.

We believe, generally, that the dental journals are conducted on quite as ethical a basis as medical journals or any of the literary journals, and a careful inspection of the dental journals will make quite as creditable a showing as any of the other publications. Therefore, we have never been able to recognize the distinction made by those in control of the *International* as regards its being so much more ethical, and, for this reason exerting a so much better influence on the dental profession than has been the case with the other dental journals.

In regard to our late contemporary being taken over by the National Dental Association, our understanding of what the arrangements were does not agree with that expressed by the editor of the *International*. As we understood the matter, the committee of five that was appointed was to take under consideration ways and means of bearing the expense of conducting the journal. Had this been satisfactorily arranged the plan was to take it over next year, the journal continuing under its regular management during 1906. We may not have understood this correctly, but believe that the majority of the Association members had similar ideas.

We also regret that the National Dental Association is not in position to have taken the journal over as its organ. We felt sure, however, that this project must fall through for want of numerical strength in the National Association. If this had, as it should, 5,000 permanent members, each paying the annual dues, it could support a journal and make it a very useful ally in the work of the Association as a power for good; but with

not more than one-tenth of that number as permanent members it had been folly from our point of view to attempt such an enterprise.

Notices.

INDEX FOR VOLUME XI.

Owing to circumstances beyond our control we have to ask the indulgence of our readers, who are awaiting the yearly index, till the next issue is published, as the usual index supplement will be included with that number.

NORTH NEBRASKA DENTAL ASSOCIATION.

The next meeting of the North Nebraska Dental Association will be held at Norfolk, April 5th.

C. S. PARKER, Secy, Norfolk.

CAPITAL CITY (MICH.) DENTAL SOCIETY.

At the annual meeting of the Capital City Dental Society held Jan. 12th, 1906, the election of officers resulted as follows: President, A. T. Gordon, Vice-president, N. H. Moore; Secretary-treasurer, F. R. Nice.

HUNTSVILLE (ALA.) DENTAL SOCIETY.

The annual meeting of the Huntsville Dental Society was held Jan. 5, 1906, and the following officers were elected: President, C. W. Kranz; Vice-president, John C. Burnam; Secretary and Treasurer, W. C. Drakeford.

READING (PA.) DENTAL SOCIETY.

At the 8th annual meeting of the Reading Dental Society held Jan. 4, 1906, the following officers were elected: President, C. R. Scholl; Vice-president, Elwood Tate; Secretary, Geo. S. Schlagel; Treasurer, John T. Bair

SPRINGFIELD (MO.) DENTAL SOCIETY.

At a recent meeting of the dentists of Springfield, the Springfield Dental Society was organized, and the following officers were elected: President, W. E. Tucker; Vice-president, Dr. Darby; Secretary and Treasurer, Dr. Boatner.

WILL-GRUNDY COUNTIES (ILL.) DENTAL ASSOCIATION.

At the annual meeting of the Will-Grundy Counties Dental Association, held at Joliet, Jan 10th, 1906, the following officers were elected: President, E. H. Stewart, Joliet; Vice-president, Dr. Van Scoyac, Morris; Secretary, Guy Saville, Joliet; Treasurer, Dr. Webb, Wilmington; Program Committee, Dr.

Wilhelmi, Joliet; Board of Censors, Dr. Green, Braidwood; Dr. Morgan, Lockport; Dr. Ireland, Joliet; Membership Committee, Dr. Lotz, Lockport; Dr. Spears, Joliet; Dr. Hoffman, Plainfield.

SOUTHERN DENTAL SOCIETY OF THE STATE OF NEW JERSEY.

The next monthly meeting of the Southern Dental Society of the State of New Jersey will be held Feb. 21, 1906. The essayist of the evening will be R. Ottolengui of New York City, and his subject is "The Treatment of Putrescent Root Canals."

PEORIA COUNTY (ILL.) DENTAL SOCIETY.

At the annual meeting of the Peoria County Dental Society held at Peoria, Jan. 2, 1906, the following officers were elected: President, R. C. Horner; Vice-president, R. L. Graber; Secretary, J. C. Murdock; Treasurer, C. Duth; Librarian, J. D. Nicol.

SANDUSKY COUNTY (O.) DENTAL ASSOCIATION.

The Sandusky County Dental Association met at Toledo, Jan. 12th, 1906, and elected the following officers: President, A. G. Thatcher, Fremont; Vice-president, W. B. Tiffany, Clyde; Secretary, George B. Smith, Fremont; Treasurer, R. Leonard, Bellevue.

LAKE COUNTY (IND.) DENTAL SOCIETY.

December 23rd, 1905, the Lake County Dental Society was organized, and the following officers were elected for the ensuing year: President, G. L. Smith, Hammond; Vice-president, L. H. Grant, Crown Point; Secretary and Treasurer, O. D. Morton, Hobart.

KENTUCKY STATE DENTAL ASSOCIATION.

The next annual meeting of the Kentucky State Dental Association will convene at Dawson Springs, Ky., June 4th, 5th and 6th, 1906. We anticipate a most pleasant as well as a profitable meeting and a cordial invitation is extended to the profession.

W. M. RANDALL, Secy, Louisville, Ky.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

The twenty-fourth annual meeting will be held at the "New Kimball House," Atlanta, Ga., commencing 10 A. M., Wednesday, September 5th, 1906. The rates per day will be on the European plan from \$1.50 to \$4.00, American plan from \$3.00 to \$6.00, governed by choice of rooms. Convention hall will be in the hotel and every effort will be made by the proprietor for the care and comfort of the members. Arrangements are being perfected for those desiring a short ocean trip for reduced rates, via the Clyde and

Old Dominion Steamship lines, notice of which will be given by circular later.

CHARLES A. MEEKER, D. D. S., Sec. and Treas.,
29 Fulton St., Newark, N. J.

NORTH DAKOTA DENTAL ASSOCIATION.

The North Dakota Dental Association was organized Jan 17, 1906, at Fargo, and the following officers were elected: President, G. A. Rawlings, Bismarck; Vice-president, H. L. Starling, Fargo; Secretary, O. H. Sossaman, Lisbon; Treasurer, Samuel Rowan, Hillsboro.

WEDELSTADT DENTAL CLUB.

At a meeting of the Wedelstadt Dental Club held at Duluth, Minn., Jan. 13th, 1906, it was decided to change the name to "Head of the Lakes Dental Club," and the following officers were elected: President, W. T. Gould; Vice-president, J. G. Findley; Secretary and Treasurer, C. E. Booth.

MINNESOTA STATE DENTAL ASSOCIATION.

The twenty-third annual meeting of the Minnesota State Dental Association will be held in Minneapolis at the Dental Department of the State University, on June 11, 12, 13, 1906.

F. E. COBB, Secy, Minneapolis.

MARYLAND STATE DENTAL ASSOCIATION.

At the annual meeting of the Maryland State Dental Association, held at Baltimore, Dec. 26th, 1906, the following officers were elected: President, H. E. Kelsey; Vice-presidents, A. C. McCurdy and C. M. Wells; Recording Secretary, W. W. Dundracco; Corresponding Secretary, F. F. Drew; Treasurer, S. C. Pennington.

FULTON-McDONOUGH (ILL.) COUNTY DENTAL ASSOCIATION.

The Fulton-McDonough County Dental Association met at Bushnell, Jan. 18, 1906, and elected the following officers for the ensuing year: President, C. B. Warner, Avon; Vice-president, O. H. Piper, Macomb; Secretary, F. V. Brooking, Macomb; Treasurer, J. B. Neilson, Vermont; Librarian, W. A. Neece, Macomb.

SANGAMO-MENARD COUNTIES (ILL.) DENTAL SOCIETY.

At the annual election of officers of the Sangamo-Menard Dental Society, held at Springfield, Jan 12, 1906, the following were named: President, James B. Watts; Vice-president, J. J. Donelan; Secretary, E. F. Hazel; Treasurer, Dr. Converse; Librarian, Dr. Barnum of Iliopolis; Board of Censors, O. L. Frazee, T. P. Donelan, Grafton Munroe; Program Com-

mittee, Mrs. G. H. Henderson, E. B. Wall, Trinkhouse; Membership Committee, A. J. Williams, G. M. O'Hara, Robert Booth.

CALIFORNIA STATE DENTAL ASSOCIATION.

The California State Dental Association and the Alumni Association of the Dental Department of the University of California will hold a joint session and clinic at San Francisco, May 14-18, inclusive, 1906.

C. E. Post, Recording Secy,
135 Geary St., San Francisco.

TEXAS STATE DENTAL ASSOCIATION.

The twenty-sixth annual meeting of the Texas State Dental Association will be held in the city of Galveston, June 14th, 15th and 16th, 1906. The indications are that this meeting will be the best ever held in Texas. All ethical practitioners are extended a cordial invitation to meet with us.

BUSH JONES, Secy, Dallas, Tex.

INDIANA STATE DENTAL ASSOCIATION.

The forty-eighth annual meeting of the Indiana State Dental Association will be held at the West Baden & French Lick Springs, Ind., June 26, 27 and 28, 1906. The social side of this meeting will be a feature, while the papers and clinics have promise of being the best ever given at this society. Ethical practitioners are invited to resort, recuperate and reilluminate with us.

R. A. ADAMS, Secy, Clinton, Ind.

ALABAMA DENTAL ASSOCIATION.

The next annual meeting of the Alabama Dental Association will be held in the Commercial Club rooms, Mobile, Ala., May 8th to 11th, 1906. A full attendance on the part of the members is urged, and a cordial invitation is extended to all *ethical non-association* dentists in the State, and to our *professional* brethren from other states. The usual one and one-third fare rate will be secured from the railroads on the certificate plan.

L. A. CRUMLY, B. S., D. D. S., Secy, Birmingham, Ala.

MASSACHUSETTS BOARD OF REGISTRATION IN DENTISTRY.

A meeting of the Massachusetts Board of Registration in Dentistry, for the examination of candidates, will be held in Boston, March 7-9, 1906. All applications, together with fee of twenty dollars, if first examination, must be filed with the secretary of the Board on or before Feb. 28, as no application for this meeting will be received after that date. Hereafter candidates for second and subsequent examinations will be required to fill out an application blank and forward it to the secretary. The fee for third and subsequent examinations is \$5.00.

G. E. MITCHELL, Secy.,
25 Merrimack St., Haverhill.

LOWELL (MASS.) DENTAL SOCIETY.

At the annual meeting of the Lowell Dental Society, held Jan. 4th, 1906, the following officers were elected: President, J. V. Peppin; vice-presidents, J. F. Walsh and N. S. Phillips; Secretary, F. S. Guilliland; Assistant Secretary, V. E. Darling; Treasurer, H. E. Jangis; Executive Committee, Hugh Walker, G. J. Constantineau, W. E. Knapp, D. G. Snyder, A. W. Burnham.

HENRY AND STARK COUNTIES (ILL.) DENTAL ASSOCIATION.

At the last meeting of the Henry and Stark Counties Dental Association, held at Kewanee, Jan. 10, 1906, the following officers were elected: President, J. C. Warnock, Kewanee; Vice-president, J. M. Manton, Buda; Secretary, H. M. Wolf, Kewanee; Treasurer, W. E. Kyle, Kewanee; Librarian, R. W. Sharp, Bradford. A special meeting will be held the first Wednesday in April.

WARREN COUNTY (ILL.) DENTAL SOCIETY.

At the annual meeting of the Warren County Dental Society held at Monmouth, Jan. 14, 1906, the following officers were elected: President, J. F. Kyler, Kirkwood; Vice-president, P. S. Orth; Secretary, H. McMillan, Roseville; Treasurer, W. S. Phelps; Librarian, J. M. Evey; Program Committee, R. H. Hood and H. W. Scott; Board of Censors, H. W. McMillan, O. M. Daymude and A. W. Glass.

FLORIDA STATE DENTAL SOCIETY.

The twenty-third annual meeting of the Florida State Dental Society will be held at the Continental Hotel, Atlantic Beach (near Jacksonville), Wednesday, June 13th, 1906, continuing in session three days.

All ethical practitioners are most cordially invited to be present. An interesting program has been arranged. A number of special clinics will be provided.

CARROLL H. FRINK, D. D. S., Cor. Secy, Fernandina, Fla.

KANSAS STATE BOARD OF DENTAL EXAMINERS.

The Kansas State Board of Dental Examiners will hold a meeting in Topeka, May 7th, 8th and 9th, for the purpose of examining candidates who desire to practice dentistry in this state.

Applicants will be examined in regular college branches, and will also be required to demonstrate their ability in the following practical work: Gold, amalgam and cement filling; vulcanite plate and kind of crown that is necessary for the clinic assigned. An opportunity will be given each to demonstrate his or her knowledge of working porcelain. Materials and furnace for this will be furnished, but for all other operations the materials, small instruments and an engine must be furnished by the candidate. All clinics will be furnished by the Board. Those intending to take the examination should have their fee of \$10.00 and names in the hands of the Secretary

by April 15th, in order that ample accommodations for each can be arranged. For further information address,

M. I. HULTS, Secy,
Hutchinson, Kan.

ST. LOUIS (MO.) DENTAL SOCIETY.

The next monthly meeting of the St. Louis Dental Society will be held the first Tuesday in March. The program for this meeting is of especial interest. A paper will be read by Dr. H. Prinz on "The More Recent Peroxides; Their Chemistry and Therapeutical Application," and will be discussed by Drs. E. E. Haverstick, A. J. Prosser, M. C. Marshall and Max Fendler. The place of meeting is the Dental Department of Washington University, Twenty-seventh and Locust Sts.

INSTITUTE OF DENTAL PEDAGOGICS.

At the thirtieth annual meeting of the Institute of Dental Pedagogics held in New York, December 28th, 29th and 30th, 1905, the following officers were elected for the year 1906. President, D. R. Stubblefield, Nashville, Tenn.; Vice-president, J. H. Kennerly, St. Louis, Mo.; Executive Board, Ellison Hillyer, Brooklyn, N. Y.; L. P. Bethel, Columbus, Ohio; J. Q. Byram, Indianapolis, Ind.; Master of Exhibits, H. E. Friesell, Pittsburgh, Pa.; Master of New Teaching Facilities, C. E. Jones, Chicago.

VERMONT STATE DENTAL SOCIETY.

The thirtieth annual meeting of the Vermont State Dental Society will be held at Brattleboro, Vt., May 16th, 17th and 18th, 1906. It is expected that we will have the largest attendance of any meeting ever held by this Society. All the leading manufacturers have signified their intention of making an exhibit of their products, and this adds greatly to the success of a convention. Every progressive dentist should be present.

Special social features for Thursday evening.

THOMAS MOUND, Secy, Rutland, Vt.

NEW YORK STATE DENTAL SOCIETY.

The thirty-eighth annual meeting of the New York State Dental Society will be held at Albany, N. Y., Friday and Saturday, May 11 and 12, 1906. Saturday afternoon will be devoted exclusively to clinics.

Any ethical member of the profession having anything of interest to present, or desiring to clinic, will kindly communicate with the clinic committee: F. Messerschmitt, Chairman, 1023 Granite Bldg., Rochester; W. D. Tracy, 46 W. 51st St., New York City; G. B. Mitchell, 448 Porter Av., Buffalo; G. A. Sullivan, 18 Dove St., Albany; F. W. Proseus, 238 Monroe Ave., Rochester.

RHODE ISLAND DENTAL SOCIETY.

At the annual meeting of the Rhode Island Dental Society held at Providence, Jan. 10th, 1906, the following officers were elected: President, John Stearns; Vice-president, James E. Power, Providence; Secretary, C. A. Carr, Newport; Treasurer, Alfred Speers, Newport; Librarian, F. B. Gleason; Executive Committee, J. J. Dolan, A. M. Potter and E. A. Charbonell.

MINNESOTA STATE BOARD OF DENTAL EXAMINERS.

The next regular meeting of the State Board of Dental Examiners will be held in Minneapolis at the Dental Department of the State University on April 3rd, 4th and 5th, 1906.

All applications must be in by Tuesday noon, April 3rd. Application blanks will be furnished upon request by,

DR. GEO. S. TODD, Secy, Lake City, Minn.

LATEST DENTAL PATENTS.

- 808,105. Dentifrice, George W. Morse, Jersey City, N. J.
808,606. Holder for toothpicks and similar articles, Charles F. Hamel, Toledo, Ohio.
808,690. Dental silk box, Otto C. Schulz, Chicago, Ill.
808,841. Apparatus for the manufacture of toothpicks, Henry S. Hopper, Detroit, Mich.
808,935. Handle for dental flasks, Theodore G. Lewis, Buffalo, N. Y.
809,365. Dental tool, Adam W. Feltmann, Chicago, Ill.

News Summary.

L. B. PORTER, a dentist of Clinton, Ky., died Jan. 3, 1906.

DR. DRAKE, a dentist of Ashley, S. D., was shot and killed Jan. 22, 1906.

J. R. PEARCE, 76 years old, a dentist of Blairsville, Pa., died Jan. 16, 1906.

JOHN J. ENNIS, 44 years old, a dentist of Brooklyn, N. Y., died Jan. 16, 1906.

L. L. DECKARD, a dentist of Reading, Pa., died of erysipelas, Jan. 16, 1906.

WM. H. CONOVER, 90 years of age, a dentist of Newark, N. J., died Jan. 7, 1906.

H. EUGENE PARK, 57 years old, a dentist of Whitehouse, N. J., died from Bright's disease, Jan. 7, 1906.

JOSEPH W. LINDSAY, 69 years old, a dentist of Grand Rapids, Mich., died Jan. 7, 1906, from apoplexy.

GEORGE H. SWIFT, 53 years old, a dentist of Syracuse, N. Y., died Jan. 16, 1906, from hemorrhage of the brain.

GEORGE E. LOVEJOY, 75 years old, a dentist of Petaluma, Cal., died Jan. 15, 1906.

CHAS. W. LOMBARD, 59 years old, a dentist of Missoula, Mont., died Dec. 25, 1905.

W. G. BROWNE, a dentist of Atlanta, Ga., died from tuberculosis of the spine, Jan. 14, 1906.

J. D. WEBSTER, 49 years old, a dentist of Wilmington, N. C., died Jan. 1, 1906, of pneumonia.

CHAS. F. ALLAN, 62 years old, a dentist of Newburg, N. Y., died of apoplexy Jan. 4, 1906.

C. E. NEIBERGER, 70 years old, a dentist of McPherson, Kan., died Dec. 31, 1905, from heart trouble.

FATALITY.—Jan. 3, a man of Malone, N. Y., took an overdose of laudanum to relieve toothache and died shortly after.

The moment passed is no longer; the future may never be; the present is all of which man is master.—J. ROUSSEAU.

BANKRUPT.—Clinton S. Herbert, a dentist of Detroit, Mich., has filed a petition in bankruptcy, giving liabilities as \$36,400.25 and assets \$553.73.

One of the fundamental rules in giving an anesthetic is to use only just enough to obtain and maintain insensibility to pain.—*Alk. Clinic*.

AN AID IN THE SETTING OF PLASTER.—After the plaster is mixed, scrape into it from an old plaster model a little plaster to facilitate the setting.

INSANITY CAUSED FROM EXTRACTION OF TEETH.—As the result of having two teeth extracted, a woman in Chicago, 34 years old, has become insane, according to newspaper report.

Every time a man smiles, and much more when he laughs, it adds something to his fragment of life.—*Lawrence Sterns*.

STERILIZING MOUTH MIRRORS.—Place the mirrors in strong alcohol until needed for use. Then wash in clean water and dry with a sterilized napkin.—E. M. KAPTAN, in *Review*.

That which people sow they shall also reap does not always apply to the pictures on the seed packages.

EXAMINING BOARD AFFAIRS.—The Governor of California recently appointed J. L. Pease of Oakland and Garrett Newkirk of Pasadena to fill the vacancies in the State Board of Dental Examiners of California.

RENEWING ZINC FOR DIES.—When the zinc used for dies gets thick and unsatisfactory, place it in the melting ladle and heat to dull redness, when a tablespoonful of strong hydrochloric acid thrown on it while stirring with a stick or an iron rod will instantly render the zinc perfectly fluid and equal to new metal.—FLETCHER, in *Archives*, 1890.

SUPPORTING A SORE TOOTH WHILE DRILLING.—Instead of supporting a tooth by ligature to prevent pain while it is being drilled, take modeling compound, soften it and make a splint for both lingual and buccal sides of the teeth to support the sore tooth while drilling. This will prevent

jarring and also prevent pressure on the inflamed peridental membrane.—T. L. GILMER, *Review*.

SENSITIVE DENTIN.—Jarring the tooth with an automatic mallet, having a blunt-point plugger in the cavity, aids materially in inducing the penetration of fluids into the dentin.—N. C. LEONARD, *Dental Headlight*.

THE APICAL FORAMEN.—The root of a permanent tooth is not fully formed and the apical foramen smaller than the root-canal until the third or fourth year after the eruption of the tooth.—*Dominion Dental Journal*.

F. L. BEECHER, 56 years old, a dentist of Rochester, Minn., died Jan. 15, 1906. His death came without warning.

TO PREVENT SHRINKAGE IN PLASTER.—Mix with lime water.—X. DODEL, *Pointers for Dentists*.

TO REMOVE PLASTER FROM FLASKS.—Dr. Buckland paints the inner surface of flasks for vulcanite work with a solution of whiting, which allows the plaster to be removed easily and protects the flask from corrosion.—*Ohio Dental Journal*, 1890.

LAC EDGE OF INLAY.—In inlay work, paint the peripheral edges of the matrix with shellac before placing the body. The shellac will burn out and prevent warping of the inlay. The crevice is filled at the second placing of body.—*Western*.

DIVORCES.—Samuel E. Burke, a dentist of Los Angeles, Cal., was granted an interlocutory decree of divorce from Florence Burke, Jan. 16.—Mrs. Bessie G. Morrow asked for a divorce Jan. 5 from her husband, George E. Morrow, a dentist of Baltimore, Md.

TRAMP.—Have you anything to do in my line to-day, madam?

Lady—What is your business?

Tramp.—I'm a dentist, ma'am. I'll put a good set of teeth in a mince-pie for you, free of charge.—*Exch.*

THE MOST POWERFUL GERMICIDE.—The best germicide is the flame; this is acknowledged. If the point of an instrument is so small that the heat will ruin it, dip it in alcohol, and as soon as it is burned off all bacteria will be killed.—*Western Dental Journal*.

A USEFUL HINT.—A piece of alum of suitable size kept in a convenient place will be found useful where the operator's hands perspire freely. Draw the fingers over the alum once and it will usually be effectual.—Dr. W. J. HEMPHILL, in *Dental Summary*.

COCAIN INJECTION.—Before injecting cocain I paint the gum with campho-phenique, full strength, to prevent pushing septic matter into the gum with the needle. The campho-phenique by benumbing the gums aids in the anæsthesia.—L. W. JORDON, *Dental Summary*.

DAILY MESSAGE OF THE GUM.—One of the wholesome things that may be done after brushing, and to be done mostly, if not entirely, by the patient and daily, or should be, is massage of the gums. This may be done with the fingers pressing hard above the teeth and squeezing and working down to the edge of the gums. A little time spent each day with gum massage

will result in those tissues becoming harder and more capable of resisting the incipient deposits, in fact dislodging some that have got a foothold.—R. B. TULLER, *American Dental Journal*.

THE ODONTAGON LAW.—The skilful operator extracts more teeth with elevators than he does with forceps, for nearly every tooth that may be grasped with forceps may be saved.—*Cosmos*.

FALSE SYMPATHY.—Countryman (to dentist)—The tooth next to that 'un aches, too, Doc.

Dentist—Yes, it aches in sympathy.

Countryman—Yank it out. Durn such sympathy.

CARE OF CHILDREN'S TEETH.—For the health of the individual, for the comfort of the family, for the welfare of the State, treat the children's teeth early and imbue them with the belief that clean teeth do not decay.—GEO. CUNNINGHAM, *British Dental Journal*.

If we look down, then our shoulders stoop. If our thoughts look down, then our character bends. It is only when we hold our heads up that our body becomes erect. It is only when our thoughts go up that our life becomes erect.—A. McKENSIE, in *Merck's Archives*.

HAND AND BRAIN.—All effort of hand and brain is expression. No two natures express the same thing or in the same way. The hand does no useful thing save as it is directed by thought; and the higher and nobler the thought the more divine the joy of life.—*The Philistine*.

A SURE CURE FOR EARACHE.—A small funnel of stiff paper is inserted into the ear, with a pledget of cotton saturated with chloroform into the outer, larger part. By this means the fumes of chloroform are blown into the ear, and instant relief is obtained.—*Courier of Medicine*.

EXTRACTING FRAIL ROOTS.—If a frail root be filled with quick setting cement just before extracting—of course allowing time for the cement to set—the danger of crushing with the forceps is lessened. Care should be taken not to force the cement beyond the apex.—A. M. WAAS, *Dental Review*.

"May we have the wit to discover what is true, and the fortitude to practice what is good."

ZINC OXYPHOSPHATE A PRESERVER OF PULP VITALITY.—In large simple cavities on the buccal or occlusal surfaces of the molars, it is my belief that the vitality of the tooth is more surely conserved by filling the cavity at least two-thirds full of oxyphosphate of zinc cement prior to the insertion of gold or amalgam.—WM. DWIGHT TRACY, *Dental Brief*.

EXAMINE THE TEETH.—There is every reason to believe that physicians can contribute in an important degree to elevate the profession of dentistry and enable it to avoid some of the demoralizing influences incident to the large number of bargain-counter dentists in the field. With symptoms of indigestion present in a given case, demands a thorough examination of the teeth. If there are carious teeth, or there are an insufficient number present to properly masticate the food, it is our duty to suggest to the

patient the necessity of consulting a thoroughly reliable member of the dental profession, whose skill and knowledge are based on a practical scientific education.—*Pacific Med. Jnl.*

A Nebraska editor stated that a certain girl's breast was filled with rage, and that wise guy, the printer, got it "rags," and now the editor is camping out on a rise northwest of the town, where he can get a good view of the landscape from four different directions.—*Selected.*

DAMAGE SUIT.—A dental parlor in Memphis, Tenn., was the defendant in a suit brought by a woman, who alleged that because she did not have the money to pay for a gold crown which had been put on one of her teeth, the operator removed the crown. The jury rendered a verdict of \$250 in favor of the plaintiff.

SEALING ARSENIC IN BUCCAL CAVITIES.—Seal arsenious acid in shallow buccal cavities with wax, melting the surface around the margins with a hot, small spatula. A good preparation of wax for this purpose is made by using beeswax one part and resin sixteen parts.—**OLIVER MARTIN**, Ottawa, Canada, in *Review*.

PULP EXTIRPATION WITH COCAIN.—Dissolve cocain crystals in adrenalin and there will be no hemorrhage. Wrap a few fibres of cotton on a broach and dip in trichloroacetic acid and insert to the bottom of the canal, cauterizing the ends of the nerve fibres. The canal is then ready for immediate filling.—**A. ENBANK**, *Dental Headlight*.

THE INLAY MATRIX.—For large fillings in molars and bicuspsids a valuable method consists in forming the matrix of heavy gold, say 36 heavy plate pure gold, having it on the inlay when inserted; after finishing it down it leaves a thin line of gold which can be burnished, and practically covers the cement line.—**VAN WOERT**, *Items*.

RUST ON INSTRUMENTS.—Coat them with mercurial ointment, and remove this before using. Instruments treated in this way will be slightly blackened, but this is in the nature of an addition, and does not affect the polish, while at the same time it will effectually prevent rusting. This is a point well worth bearing in mind.—*Alk. Clinic*.

A subscriber who was in arrears to a rural paper was dying, and the editor dropped in to see him.

"How do you feel?" asked the pencil pusher.

"All looks bright before me," gasped the subscriber.

"I thought so," said the editor. "You'll see the blaze in about ten minutes."—*Exch.*

HEMORRHAGE FROM ROOT-CANALS.—While adrenalin chlorid, hydrogen peroxid and many of the hemostatic or oxidizing agents are recommended for the control of the hemorrhage and the evacuation of blood, it is my belief that no effort to control it should be made; that it should be allowed to bleed freely, and that the blood should be evacuated from the canals only by such mechanical means as tepid water or shreds of cotton, or bibulous paper twisted on the broach, or by some agent such as alcohol or

chloroform which will dissolve the blood, for the reason that such a proceeding relieves the congestion in the apical area, and is an important factor in preserving the color of the tooth.—Dr. GOSLEE, in *International*.

FORM OF CAVITY FOR INLAYS.—Prepare your cavities so that you get what I term a lapped joint—not that the porcelain laps upon the outside of the tooth in any sense, but that the porcelain entering the cavity forms a lapped joint instead of a butt-ended joint, or so formed that the porcelain enters wedge-shaped into the cavity.—W. T. REEVES; Chicago, in *Review*.

REMOVING IRON STAINS FROM THE TEETH.—You will find that lemon juice followed by H_2O_2 will remove the stains of iron from the teeth in most cases. In some cases, where the enamel has been worn and the substratum has been stained, it is impossible to remove the discoloration, as the bone cells themselves contain a lime and iron salt which is irremovable.—*Alk. Clinic*.

CLEANLY PRACTICE.—The cleanly practice of dentistry, as I conceive it, is as follows: A clean napkin on the head-rest and an aseptic paper cover on the bracket table. A sterilized mirror and cotton pliers in the warm-water heater. The patient is seated, the chair adjusted, and a freshly laundered table napkin pinned to the shoulders of the garment.—Dr. VOYLES, in *Dental Brief*.

ACCIDENTS.—The explosion of a vulcanizer in the office of a dentist of Youngstown, O., nearly resulted in the death of a patient, as the shock threw him from the chair.—A dentist of Hudson, O., lost the sight of one eye when his vulcanizer exploded Jan. 2.—A man at Hagenbuch Sta., O., narrowly escaped death Jan. 4, from hemorrhages resulting from the extraction of teeth by a dentist.

DRESSING FOR BURNS.—In extensive burns there is nothing better in the early stages than a 5 per cent. mixture of ichthyol and vaselin, says Stuart McGuire of Richmond, Va. In sluggish granulations, especially of a tuberculous character, good will result from the application of 1 per cent. carbolic acid, 5 per cent. balsam peru, and 94 per cent. castor oil.—*Charlotte Med. Jour.*, April, 1905.

ADAPTATION OF PARTIAL DENTURES.—When only one or two teeth remain, as the two upper canines, for instance, a closer adaptation may be secured by slightly trimming the plaster teeth and completely encircling them with soft or velum rubber. Pack the ordinary rubber around this and vulcanize as usual. This will give a support superior to that given by clasps and less harmful to tooth structure.—*International*.

PAIN AFTER EXTRACTION.—Thoroughly curette the alveolus, thus removing all disorganized tissue, coagulated blood and alveolar debris, if any is present. The alveolus is then copiously irrigated with hot water, and after drying with cotton an application is made of two drops of pure carbolic acid, and the alveolus is loosely packed with sterilized gauze. If the pain does not subside, an application should be made of campho-

phenique and morphin-acetate. A small pellet of cotton is saturated with campho-phenique, and after taking up with a small amount of morphin-acetate is carried to the bottom of the painful alveolus. The morphin-campho-phenique dressing produces most remarkable results in the sense that the pain disappears almost instantaneously with the introduction of the dressing.—DR. ENDELMAN.

DENTAL SOCIETIES.—The dental society is not merely a factor intended to promote a closer friendship among practitioners; it is a body of intelligent men who, having spent years of labor in perfecting themselves in the knowledge of dental art and science, are in duty bound to protect and educate the public from the ignorant fakir whose only object is to separate the victim from his money.—DR. J. K. CONROY, in *Dental Brief*.

PLASTER OF PARIS AND PARAFFIN WAX AN EXCELLENT CARVING MATERIAL.—If you will take ordinary paraffin wax, melt it in a large spoon and stir plaster of paris into it while it is in a molten condition you will find that it will make one of the nicest carving materials that you have ever used. Make it plastic by heating, apply it to the primary crown and allow the patient to bite into it, and you have the cast.—J. Q. BYRAM, *Dental Register*.

How to Do It.—I was told once how to carry a very small portion of cement. Take a very delicate broach, and either make a little ring at the end of the broach, or bend the point at an angle of 45 degrees, or 90 degrees—just a little bend that you would almost have to take a magnifier to see—and you will find you can carry a little globule on the end of the broach. Otherwise it would tend to run back.—DR. W. V. B. AMES, in *Dental Review*.

ETHYL CHLORID, says Dr. Henry Girard, in the *Revue de Chirurgie*, gives perfect anesthesia in man as in animals. Its action is rapid, the excitement slight, there is no reaction, and the return to consciousness is instantaneous. Therefore, care is necessary to continue the anæsthetic until the operation is over. As very little air should be inspired, a good apparatus is needed. It is to be preferred for minor operations, since it is not followed by nausea or vomiting. It does not irritate the larynx, but may produce renal, hepatic and cardiac lesions. It may be given first, followed by ether or chloroform, with good results.

WHAT WAS THE MATTER? A dentist recently sent a patient, for whom he had inserted a full denture, to me to see if I could ascertain what was the reason her teeth did not work satisfactorily. I found by pressing the lower plate down to its bearings and removing the pressure the plate would be lifted up by the mass of glands and loose integuments, which would rise one-quarter of an inch above the margins of the jaw on the lingual side when the plate was out. This is a very common fault in lower dentures, and in such cases the margins of the plate should be cut away until it is no longer lifted. This was not the only difficulty. The articulation was faulty, and this is another common fault. Having

ascertained the cause of the trouble, it was a simple matter to relieve the patient.—L. P. HASKELL, *Dental Review*.

PROXIMAL CAVITY PREPARATION.—I am a great advocate of the occlusal step in proximal cavities. From the standpoint of convenience I find it an excellent thing, especially in the distal cavities of the molars; by extending a right angle step we can see into the cavity and be sure of a strong wall. It is difficult to get the anchorage in the buccal and lingual walls sufficiently strong and safe without some danger of tipping.—DON M. GALLIE, Chicago, in *Review*.

TO ROUGHEN THE SURFACE OF A SOLID GOLD INLAY.—Take a plugger point that has been well tempered and grind the end to a needle point. Insert in the engine mallet, place the inlay in something solid, preferably a hammer handle with a small end, so the inlay may be held firmly, and while running the engine at a high speed direct the blow at different angles upon the inlay. This produces a surface to which cement will adhere firmly. G. S. HERSHEY, in *Dental Review*.

SHARPEN A LATHE CONE.—If the thread of the cone on your lathe has worn so smooth that it will not hold your brush wheels or polishing wheels, take a small three-cornered file and hold the edge in the grooves of the thread and run the lathe toward you. Allow your arms to carry the file at the same angle as it moves up on the cone. By chasing over the cone a few times you will be pleased to find that you have a new sharp thread that will hold the wheels steadily.—C. F. GRAHAM, in *Dominion Journal*.

IODINE.—

"What do we get from iodine?"

Inquired the tutor placid.

"I think," replied a brilliant youth,

"'Tis idiotic acid."

The tutor frowned and said, "A-hem!

Young friend, have you been taking some?"

—Exch.

AN AID IN POLISHING DENTURES.—A small brushwheel compounded with a single row of moderately stiff bristles is excellent for polishing round plain teeth in vulcanite work. If wet soap is applied to the bristles they will retain the wet pumice and cut like a knife. Soap rubbed on a felt buff-wheel will retain the wet pumice, causing it to cut much faster and considerably lessening the time and labor of polishing an artificial denture.—*Dental Register*.

ILLEGAL PRACTITIONERS.—Dec. 30 a man was fined \$50 for practising dentistry without a license.—Jan. 9 a man at Cripple Creek, Col., was found guilty of practising dentistry without a license.—He had been found guilty before on the same charge.—Dec. 26 a woman was charged with practising dentistry without a license, at Boston, Mass. Investigation was made after she had injured the jaw of a woman patient.—Jan. 5 a man was charged with practising dentistry at Minneapolis, Minn., without being properly licensed.—

Jan. 29 a man was arrested in St. Louis, Mo., for practising dentistry without a license.—Jan. 16 a man was found practising dentistry without a license at Brooklyn, N. Y.

ADVICE TO PATIENTS.—There is only one way in which I can bring people to appreciate the value of cleanliness in the mouth, and that is to tell them that they would not sit down at a table to eat with knives and forks that were one-tenth as dirty as their own teeth are, and still they have their teeth in their mouth all the time. That comes nearest of anything I have found to bringing them to their senses.—E. A. ROYCE, in *Dental Review*.

TAKING IMPRESSIONS.—I have one little suggestion to offer in the taking of impressions—particularly in those cases that are extremely sensitive and easily nauseated—that I have found useful and helpful, and that is to sponge the mouth with hydrogen dioxid. After thus having cleaned all the mucuous surfaces apply a 1 to 100 solution of eucaïn to the whole palate. That will enable one to take an impression in the most exaggerated cases of palatal sensitivity.—T. B. HARTZELL, *Texas Dental Journal*.

SILEX IN THE MUFFLE.—Coarse sillex sprinkled over the floor of the muffle will prevent adhesion of trays, whether of clay or platinum. The advice of muffle makers is to remove the tray while the muffle is at white heat; this to avoid bringing more or less of the luting with it and at the same time disturbing the wire that the luting is designed to protect. No attempt should be made at any time to remove the sillex; most of it becomes a fixture and serves a good purpose while the muffle holds out.—D. O. & L.

AN ALL-ROUND EDUCATION.—For an all-round education, then, I make a special plea; for the all-round man, for one who has an ability to use his mind, with wits so trained that he can readily turn his hand to any emergency and be the master of any situation that may arise. Perhaps the most valued advantage of an all-round education is the breadth and scope it gives the mind itself, the enjoyment and usefulness it brings into life, the stimulus it brings to some brother less fortunate than its possessor—the useful hint, the practical help, the sympathy and understanding of human needs and endeavors.—C. L. HUNGERFORD, in *Western Dental Journal*.

WET DRESSINGS.—Wet dressings are advocated as opposed to dry occlusion in the treatment of infected wounds. He maintains that wet aseptic and antiseptic dressings present the important advantages over dry dressings, that they prevent the coagulation of the secretion of the wound upon the dressing material, while they completely absorb the secretion, and thus have a favorable influence upon the healing of infected and suppurating wounds. The advantage of dressings moistened with a 0.1 per cent. of caustic soda is not so much due to the influence of the chemical employed as to the fact that the compresses are moist. He reports a number of cases of infected wounds in which wet compresses accomplished very satisfactory results. Weak solutions of chinolol 0.1 per cent. in strength,

or a weak solution 2 per cent. of ichthyol were employed.—M. A. ZAU-SAILOFF, *Roussky Vrach*, Sept. 17, 1905.

FIRES.—F. W. Day, Bloomington, Ill., Jan. 17; loss, \$1,300, insurance, \$650. Dr. Schuyler, De Kalb, Ill., Jan. 10; nominal loss.—C. P. Miller, Terre Haute, Ind., Dec. 28; loss, \$100.—J. S. Sneider, Kansas City, Mo., Jan. 5; nominal loss.—J. F. Hardman, Kansas City, Mo., Jan. 5; loss \$100. King & Lewis, Kansas City, Mo., Jan. 5; loss \$250.—W. M. Berry, St. Louis, Mo., Jan. 15; nominal loss, insurance \$1,000.—W. E. Elliott, Pittsburg, Pa., Jan. 17; loss, \$300.—A. J. Hager, Hartsville, Tenn., Dec. 28; loss \$300, no insurance.—

Money is always forthcoming for our caprices; we only grudge the cost of things that are useful or necessary.

CLEANING TEETH.—Cleaning teeth for show and cleaning teeth conscientiously for the preservation of their health are two different things. The patrons of our profession, however, do not always appreciate the difference, especially when time must be consumed to do honest work and a fee charged accordingly. Some dentists—too many—have a fixed fee, and a small one at that, for cleaning teeth, with the result that only the effort is expended that in their estimation fits the fee, and that is mostly mere cleaning for show. 'One cannot prevent pyorrhea in that way.—R. B. TULLER, in *American Dental Journal*.

Loving kindness is greater than laws; and the charities of life are more than all ceremonies.—*The Talmud*.

HOT AIR AS A PYORRHEA TREATMENT.—In the discussion of a paper read before the Chicago Odontological Society and printed in the January *Dental Review*, Dr. George W. Cook suggests that hot air injected into pyorrhea pockets should promote healing. Dr. Brophy states that he has used it advantageously after curetting the antrum. He thinks its virtue in this case depends on the fact that it dries the surface and produces increased absorption of remedies applied as antiseptics or stimulants. He therefore thinks the drying of the pockets previous to medication should materially assist the penetration of the medicaments.

PORCELAIN CROWN.—Diatoric teeth make good bicuspid crowns, especially for lowers. Bake a pin into the tooth, and it can then be adjusted with or without a band, and finished in the usual way. OLIVER MARTIN, Ottawa, Canada, in *Review*.

THE PHYSICIAN'S FEE.—A Philadelphia judge has given expression to the opinion that "the life of a rich man is worth more than the life of a poor man, and the physician has the right to charge the millionaire more for his services than he does the laborer." He went on further to say that "the physician is unlike the merchant, who has goods of different quality to sell at various prices. He must give his best service in every case. But it does not follow that the service is worth the same in every case. Human life has a pecuniary value of variable quantity, greater in the millionaire than in the laborer. Thus, the practitioner of

common sense has a maximum and minimum charge, and makes out his bills to suit the pecuniary circumstances of his patients." From this view there will be no dissent on the part of right-thinking people.—*Medical Record*.

X-RAY IN THE DIAGNOSIS OF NEURALGIA.—In any case of neuralgia it is our duty to have a radiograph taken. If the skiagraph be negative, you have, at least, done your duty. An inverted third molar is a common cause of facial neuralgia, the crown of the tooth pressing on the nerves passing through the inferior dental canal. I can not imagine how a tooth could be in that position without producing such results.—T. W. BROPHY, *Cosmos*.

CAVITY MARGINS FOR INLAYS.—Every portion of the cavity, and in particular the edges, should not only be well shaped, but brilliantly polished. With small Arkansas stone-points a beautiful finish can be obtained, which should extend over the edges, giving everywhere in the neighborhood of the cavity a polished surface, from which it is easy to remove the matrix. It is folly to attempt making a perfect matrix against a sharp, uneven or rough edge, or to expect always to remove it without accident from a cavity around which rough surfaces have been left.—DR. N. S. JENKINS, Dresden, Germany, in *Dental Review*.

DON'TS ABOUT ALVEOLAR ABSCESSES.—Don't treat alveolar abscesses having a fistulous opening through canal of the tooth, and leave the canal open.

Don't treat such an abscess with carbolic acid, or any drug that will harden the contents of the pus sac.

Don't inject such an abscess every day with an irritant disinfectant; give nature a chance to heal it.

Don't inject dioxogen through the apical opening into a blind abscess; the sudden liberation of gas will make trouble.

Don't practise "immediate root filling" in the treatment of any form of alveolar abscess.—DR. J. B. WILLMOTT, in *Dominion Dent. Jnl.*

TO DEADEN NOISE IN THE LABORATORY.—The noise caused in striking up plates is often a source of annoyance to the dentist and his neighbors. The following extract from *La Nature* may therefore be of some service to our readers:

"M. Prache has after a long study of the different kinds of vibrations and earth tremors, also of noises and shocks, which he has classified into groups in accordance with the method in which they are propagated, devised a system of preparing insulated foundations. He experimented with a great variety of substances, and found that india-rubber was the only one which possesses in a high degree the three necessary qualities of homogeneity, durability and elasticity. By means of a series of theoretical investigations, he was able to formulate the speed with which vibrations are transmitted through rubber, which may, by having recourse to suitable precautions, become as low as a few meters only per second. Instances are given of numerous cases in which, by the use of M. Prache's foundations, machinery which has before

caused considerable annoyance, has been completely silenced. In one case, the sound of a weighty hammer used for beating leather and striking 150 blows per minute on an anvil 4.72 in. in diameter, could no longer be heard through the party wall which separated the workshop from an adjoining dwelling, where a sick child was in bed. It is pointed out that there are a multiplicity of uses for this invention, especially in connection with electric power stations, which sometimes gives rise to great inconvenience, especially at night, when surrounded with residences."—*Dental Record*.

SENSITIVE DENTIN.—Erythrophlein chlorid is the agent *par excellence* for the treatment of sensitive dentin. It has no caustic action, its effect being merely one of intense vasoconstriction. The insertion of the gutta-percha sealing is followed by no discomfort, the symptoms of pericementitis which may occasionally develop being very light. Its absolute innocuousness makes it especially applicable to the devitalization of the pulps of deciduous teeth. A dressing of erythrophlein chlorid permits of painlessly excavating hypersensitive cavities. Remove at the expiration of twenty-four and *not more* than forty-eight hours.—M. ANDY, *L'Odontologie*.

DON'T WAIT FOR THE COLLEGE SWAGER.—A cheap and a very effective swaging device can be made out of an iron cap for one-inch gaspipe by filling it with lead or soft solder to within a quarter of an inch of the top and the balance with sealing wax or Ash's dental lac. Warm the lac over a Bunsen flame until it softens and begins to flow; then press your plate tooth, extracted tooth or a form from the Hollingsworth system, or some other system, into the lac, cooling in water. Place a piece of gold over the impression in the lac and with a small piece of soft rubber (a half-inch cube is good size) and a three-quarter-inch punch drive gold into impression. Just as good work can be done with it as with one costing from \$1.50 to \$10, and this only costs 5 cents for cap at any plumber's establishment and 20 cents for a cake of Ash's lac at the dental supply houses. A piece of hardwood answers for a punch as well as steel.—L. O. FRANZ, in *Dental Summary*.

WHAT AN UNCLEAN MOUTH MAY LEAD TO.—The observations of Miller and Macfadyen have shown that only a portion of the large number of organisms which obtain access to the stomach is destroyed by the gastric juice, and that it is only when the acidity is considerable—after meals—that such destruction takes place. Consider, then, the result of constantly swallowing septic organisms which have survived a period of existence in the saliva, into a stomach where the normal acidity has been diminished by constant catarrh. It is obvious that the opportunities of the bacteria would be very great, especially between meals, and according to Dr. William Hunter, who has done so much work on this subject, an actual infection of the mucosa with pathogenic organisms may occur. Thus a septic catarrh is set up, followed later by increase of connective tissue and glandular atrophy. I cannot do better than quote Dr. Hunter's words, in which he summarizes the symptoms: "The ashy-gray look and general languor which such patients in one's experience characteristically present are really mani-

festations of long-continued septic absorption; the local symptoms of clamminess of the mouth, distaste for food, coated tongue, and bad taste in the mouth, which one simply looks upon as manifestations of gastric catarrh, are really the result of oral sepsis; while the nausea, indigestion and gastric discomfort are the results of 'septic' gastric catarrh, produced by direct infection of the stomach with the pus-organisms."—NORMAN G. BENNETT, *Brit. Dental Journal*.

A REMEDY FOR FACIAL ERYSIPELAS.—Dr. E. S. Breese says: "As soon as a diagnosis of erysipelas is made, a calomel purge is given, tincture of chlorid of iron in moderate doses ordered every three hours, and ichthyol and tincture of iodine, equal parts, painted well over the diseased area. The local application is made daily, care being taken to go beyond any spreading border. The symptoms usually abate in three to five days. The epidermis of the painted area exfoliates. The temperature seldom becomes high, and delirium occurred only twice. This remedy is mentioned because it has been tried, and acts almost like a specific."—*Dietetic and Hygienic Gazette*.

TESTS FOR THE PURITY OF THE ESSENTIAL OILS.—The volatile oils are often found adulterated in commerce. When adulterated with fixed oils the fraud can be detected by pouring a little of the oil in alcohol. The volatile part of it dissolves readily, while the other floats on the alcohol. Another simple test is made by putting a drop of the specimen on a piece of paper and exposing that paper to a gentle heat. The essential oil evaporates, while the fixed oil remains in the form of a greasy spot on the paper. If adulterated with alcohol, it can be detected by dropping a few drops of the specimen in water. If any alcohol is present the water becomes milky. Another adulteration is often made by mixing expensive oils with cheap ones; but I cannot give any sure test for this case. The druggist finds it with the help of experience, and the dental practitioner, employing only the cheap oils, does not need to be on the lookout for this kind of adulteration.—A. AUGUSTO, *Pennsylvania Dental Times*.

METHOD OF RESETTING AN UPPER DENTURE WHEN THE BITE IS SATISFACTORY.—Mix a medium sized batch of plaster and pour over lower bow of articulator on glass slab and place the plate to be reset (with parts in position), on the soft plaster, sinking it about one-half the length of the porcelains on labial and buccal surfaces. Procure plaster model in the usual manner and place it in the old plate and with upper bow in position pour on plaster to attach model to bow. After it has set remove model from plate by opening the jaws of articulator and by a little careful manipulation the plate can be removed from the plaster. Now take off the teeth and replace them in their respective places in the plaster on articulator. Apply base plate wax in usual manner and trim to desired size. (This can be found by tracing the outline of the old plate before removing from the model.) Close the articulator, flow wax around labial and buccal surfaces, attaching the teeth to base plate, open the articulator

carefully, wax up inside and finish by waxing up outside, and the plate is ready for investment.

By this method you furnish your patient with a new plate with identically the same bite as the old one, save yourself the time and trouble of taking a wax bite, setting up the teeth, and trying them in the mouth, and can have the plate ready for investment in less than an hour from the time of taking the impression, and the result has always been with me: "It's the best fitting plate I ever had." I think simply because the patient does not have to become accustomed to a different bite.—D. F. H. WILLIAMS in *Dental Summary*.

RELATION OF DISEASES OF THE EYE AND TEETH.—Dr. Wendell Reber (*Ophthalmology*, vol. i., No. 1) comes to the following conclusions:

(1) The ophthalmologist should seek the assistance of the dental surgeon in all cases of unexplainable paralysis, of the accommodation, dilatation of the pupil, palsy or spasm of the external ocular muscles, corneal ulcers, phlyctenular disease, lachrymal fistula, orbital cellulitis, abscess, caries and periostitis, and in threatening glaucoma without apparent cause.

(2) The dental surgeon should refer to the ophthalmic surgeon patients that develop any ocular symptom whatever, and in particular those exhibiting altered pupils or accommodation, lowered vision and painful eyeballs and swollen lids or orbital margins with prominence of the eyeball. The latter is particularly important, as pus in the orbit will almost invariably do some damage.

(3) From two to ten days is the time wherein infection from an alveolar wound is most likely to take place.

(4) The so-called reflex affections (traumatic hysteria) may occur at almost any time within six months after contraction.

(5) Eye-strain in certain diseases of the eye may give rise to neuralgia reflected along the dental branches of the fifth nerve, and thus make it appear as though the teeth were the primary offending cause.

(6) The small and the first great molar provoke the process, which later involves the antrum of Highmore, and even the orbit.

MARRIAGES.—Harry Armstrong, a dentist of Hammond, Ind., was married to Miss Delia McGarry of Hammond, Jan. 8.—Frank B. Bostwick, assistant court dentist to the King of Spain, was married to Miss May Eoff of Plainfield, N. J., Jan. 23.—W. C. Chapline, a dentist of Los Angeles, Cal., was married to Mrs. Rose C. Purdy of Los Angeles, Jan. 15.—Gilbert M. Davis, a dentist of Chicago, was married to Mrs. Shire of Chicago, Dec. 20.—F. S. Earhart, a dentist of Hillsboro, Ill., was married to Miss Nellie O'Connell of Effingham, Jan. 3.—Guy Emrick, a dentist of Ft. Wayne, Ind., was married to Miss Georgiana Sterling of New Era, Ind., six months ago.—J. Ralph Erb, a dentist of Altoona, Pa., was married to Miss Zena F. Young of Philadelphia, Dec. 26.—Harry H. Hann, a dentist of Dover, N. J., was married Dec. 25, to Miss Amelia A. Beck of Baltimore.—Leslie Hyland, a dentist of McFarland, Wis., was married to Miss Jennie DeLap of Rockford, Jan. 3.—Ora B. Kneirley, a dentist of Dayton, O., was married to

Miss Bessie W. Backus, Dec. 25.—M. V. McGinnis, a dentist of Philadelphia, was married to Miss Elizabeth M. Malia of St. Clair, Dec. 28.—Edwin D. Phillips, a dentist of Cleveland, O., was married to Miss Flora A. Dean, Dec. 27.—Chas. H. Porter, a dentist of Seward, Neb., was married to Miss Bertha Carney of Sutton, Jan. 10.—Olin E. Stiyer, a dentist of Kendallville, Ind., was married to Miss Perle L. Poyser of Goshen, Dec. 20.—W. T. Walker, a dentist of Centreville, Ala., was married to Miss Fannie Boling, Centreville, Jan. 24.—L. A. Whipple, a dentist of Little Rock, Ark., was married to Miss Mabel Tubbs of Chicago, Dec. 26.

ARTIFICIAL TEETH IN TALMUDIC LITERATURE.—Dr. V. Guerini's article on "Dental Art Among the Romans and Etruscans" impelled me to look up some Hebrew literature of the same period, and I was surprised to find more than I was looking for. The Babylonian Talmud (English edition by Dr. Michael L. Rodkinson) furnished all the facts indirectly. The entire Talmud contains two distinct departments—(1) Mishna and (2) Gemara. The Mishna was compiled in Palestine by Rabbi Jehuda Hanasi at the beginning of the second century, and was divided into sections. The Gemara is a compilation of discussions and commentaries upon the Mishna. The discussions were carried on in colleges in Babylon especially established for such purposes, during a period of five centuries, and were finally concluded with the injunction that "nothing more be added."

In the volume named "Sabbath," Chap. vi, there is a list of articles which one is forbidden to carry along on the day of Sabbath, according to the Jewish faith, and among these the following occur: "It is forbidden to carry the Thathabath tooth, the gold tooth, and the silver tooth." What is a "Thathabath" tooth? The commentary of Rashi explains that it is a tooth of a human being placed within the space of a missing tooth, and held by the mere pressure of the walls of the adjoining teeth—an explanation not very easily understood.

The gold and silver teeth are coverings, according to the shape and size of the tooth, for the purpose of concealing any defect in a tooth, or for preserving a tooth from further decay. (It is understood that Miller's theory was not known at that time.) The gold or silver tooth used to be worn loose, in order that it might be taken off without difficulty when food accumulated or when repolishing was desired. Here we have the nucleus of the present removable bridges.

Among the articles allowed to be carried on the Sabbath we find mentioned in the same chapter some trinkets serving as accessories to the toilet of the fair sex, as necessary to personal health, or in emergency cases. They are the following: A grain of pepper and a grain of salt—the former as a deodorant for the breath, and the latter as a remedy for toothache—or whatever else she is accustomed to keep in her mouth (meaning ginger or cinnamon), also cachous for purifying the breath.

A very curious remedy is also mentioned, "eggs of grasshoppers" for toothache. For the relief of insomnia, the tooth of a fox is spoken of.—BENJ. A. KREIDMANN, NEW YORK CITY.—*Dental Cosmos*.